UNIVERSITAT DE BARCELONA

Salt in our veins

The patrimonialization processes of artisanal salt and saltscapes in Europe and their contribution to local development

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Barcelona, 03 / 2017

This thesis is dedicated to J., my partner in life and salt

Um cristal de sal
É um sopro de vento
É um pedaço de mar
É um átomo do Sol
É uma lágrima
É uma gota de suor

Nucleo Museologico de Sal
Figueira da Foz (Portugal)

Abstract

This thesis aims to understand the processes of patrimonialization that take place in artisanal salinas in Europe and analyzes how these can contribute to the preservation of heritage, landscape and local development in their environment. In the last century, artisanal salt making sites in Europe have suffered a progressive decline, as a result of profound socio-economic changes, that have affected productive activities in general. This has limited their ability to compete in the mainstream salt market, which has ultimately led to the permanent abandonment of the salt making activity in most cases. In others, however, local stakeholders (environmentalists, cultural associations, scholars, public administrations, others) have been able to spark, push forward and even consolidate a patrimonialization process based on the sustainable use of the associated heritage and landscape values. To achieve this, many products and services associated with the production of high quality salt, as well as ecocultural tourism activities and salt-related museums, and the provision of health services from salt sub-products have been designed and offered. These have contributed to maintain a multifunctional use of the site with a diversified socioeconomic activity with enough profitability, while respecting the natural values of the sites. In this process, the sites have therefore moved from a situation of managerial indifference or even abandonment, to a collective, highly motivated citizen-led effort to recover the heritage and natural values of the sites. At a certain point, as the complexity of the processes increased, this horizontal and generally altruistic approach, needed to evolve towards a new management environment led by professionals. In the end, these sites have thus progressed from the salt business to the business of salt-related heritage.

In this thesis, three paradigmatic cases of successful patrimonialization have been analyzed in Europe: the *marais salants* of Guérande, in France; the salinas of Sečovlje in Slovenia and the Læsø saltworks in Denmark. In addition, the patrimonialization processes have also been studied in the nine Spanish inland salinas which have been protected by law as a monument at the time of writing: Añana (Álava), Arcos de las Salinas (Teruel), Espartinas (Madrid), Gerri de la Sal (Lleida), Imón and San Juan (Guadalajara), Peralta de la Sal (Huesca), Poza de la Sal (Burgos) and Rambla Salada (Murcia). In these cases, the processes have been found to be in very different stages, from a situation of decline and almost ruin, to a consolidated patrimonialization process. Many cases, however, have been found to be in intermediate situations, with a patrimonialization process still in in progress, with the threats and weaknesses this stage entails. The comparison of these differences has allowed to understand the challenges and difficulties faced by this type of cultural heritage and landscapes, as well as to identify the good practices that have contributed to their progression towards a consolidated stage.

To this end, the methodology used in this work combined tools from different disciplinary backgrounds. On the one hand, a set of qualitative and quantitative indicators has allowed to perform a comparative analysis of the sites. On the other hand, the study of the local bibliography and the field visits, in combination with personal interviews and group dynamics, has allowed to elaborate the narratives of the patrimonialization processes of each site. The comparative study between the twelve salinas has also led to the development of a conceptual management model that gathers the good practices and prevents the pitfalls observed in the study sites. Hopefully this model will contribute to the sustainable use of similar cultural landscapes and heritage to those studied here.

Keywords: salinas, cultural landscapes, management, sustainability

Resumen

Esta tesis tiene como objeto comprender los procesos de patrimonialización que tienen lugar en salinas artesanales en Europa y analizar de qué manera éstos pueden aportar a la conservación del patrimonio, del paisaje y al desarrollo local en su entorno. Las salinas artesanales europeas han sufrido en el último siglo un progresivo declive, fruto de diversos factores socioeconómicos. Ello ha limitado su capacidad para competir en el negocio tradicional de la sal, abocando a algunas al abandono definitivo. En algunos casos, sin embargo, los agentes sociales (sociedad civil, administraciones, otros) han sabido iniciar e incluso consolidar un proceso de patrimonialización basado en un aprovechamiento sostenible del patrimonio y del paisaje. Para ello se han propuesto muy diversos productos y servicios asociados a la sal de calidad, el turismo ecocultural y la salud, logrando así mantener una actividad socioeconómica con suficiente rentabilidad al tiempo que se respeta al medio. Así, estas salinas han pasado de vivir del negocio de la sal al negocio del patrimonio. En esta tesis se han estudiado tres casos de patrimonialización paradigmáticos en Europa: las salinas de Guérande, en Francia; Sečovlje, en Eslovenia y Læsø, en Dinamarca. Además, se ha estudiado el proceso de patrimonialización en las nueve salinas de interior españolas que han sido protegidas como Bien de Interés Cultural: Añana (Álava), Arcos de las Salinas (Teruel), Espartinas (Madrid), Gerri de la Sal (Lleida), Imón y San Juan (Guadalajara), Peralta de la Sal (Huesca), Poza de la Sal (Burgos) y Rambla Salada (Murcia). En estos casos, los procesos se encuentran en fases muy diversas, lo que ha permitido entender los retos y las dificultades a los que se enfrentan este tipo de patrimonio y paisajes culturales, así como detectar las buenas prácticas que se han dado en ellos. A tal fin, se ha empleado una metodología que combina el uso de indicadores cualitativos y cuantitativos, con entrevistas y dinámicas de grupo. Todo ello se ha complementado con el estudio bibliográfico y visitas de campo a cada espacio, lo que ha permitido elaborar las narrativas de la patrimonialización de cada uno de ellos. El estudio comparativo entre los doce espacios salineros ha conducido, así mismo, a la elaboración de un modelo de gestión, que esperemos contribuya al aprovechamiento sostenible de paisajes culturales y espacios patrimoniales similares a los estudiados aquí.

Palabras clave: salinas, paisajes culturales, gestión, sostenibilidad

Resum

Aquesta tesi té com a objecte comprendre els processos de patrimonialització que tenen lloc en salines artesanals d'Europa i analitzar què poden aportar a la conservació del patrimoni i el paisatge, i al desenvolupament local. En el curs de l'últim segle, les salines artesanals europees han patit un declivi progressiu arran de la incidència de diversos factors socioeconòmics. Això ha limitat la seva capacitat per competir en el negoci tradicional de la sal, abocant-les en molts casos a l'abandonament definitiu. En d'altres, però, els agents socials (societat civil, administracions i altres) han sabut iniciar i fins i tot consolidar un procés de patrimonialització basat en l'aprofitament sostenible del patrimoni i el paisatge. En aquest context, s'han proposat productes molt diversos i serveis associats a la sal de qualitat, el turisme ecocultural i la salut, aconseguint mantenir una activitat socioeconòmica rendible alhora que respectuosa amb el medi ambient. Aquestes salines han passat així de viure del negoci de la sal a recolzar la seva activitat en el negoci del patrimoni. En aquesta tesi s'examinen tres casos de patrimonialització paradigmàtics a Europa: les salines de Guérande (França), Sečovlje (Eslovènia) i Læsø (Dinamarca). A més, s'analitza el procés de patrimonialització a les nou salines d'interior espanyoles que han estat declarades com a Bé d'Interès Cultural: Añana (Àlaba), Arcos de las Salinas (Terol), Espartinas (Madrid), Gerri de la Sal (Lleida), Imón i San Juan (Guadalajara), Peralta de la Sal (Osca), Poza de la Sal (Burgos) i Rambla Salada (Múrcia). En aquests casos, l'esmentat procés es troba en fases molt diverses, el que ha permès entendre els reptes i les dificultats a què s'enfronta aquesta mena de patrimoni i els seus paisatges culturals, així com identificar les bones pràctiques que s'hi ha donat. Amb aquesta finalitat, s'ha emprat una metodologia que combina l'ús d'indicadors qualitatius i quantitatius, amb entrevistes i dinàmiques de grup. Tot això s'ha complementat amb un estudi bibliogràfic i visites de camp a cada espai que han possibilitat reconstruir les narratives de la seva patrimonialització. L'anàlisi comparativa d'aquests dotze espais saliners ha permès, alhora, l'elaboració d'un model de gestió que pretén contribuir a l'aprofitament sostenible de paisatges culturals i d'espais patrimonials similars als que aquí s'han considerat.

Paraules clau: salinas, paisatges culturals, gestió, sostenibilitat

Acknowledgements

This thesis was born a very long time ago, well before I was in fact aware of doing it. It has been a true long distance race and many people have been, consciously or not, involved in it. It would be long and tedious to try to name all the friendly smiles and helping hands to whom I am indebted. Therefore, I have decided to give my word of thanks an artistic twist. By way of this drawing, I want to especially acknowledge the friendliness, generosity and hospitality of all the informants, as well as many other friends, who have welcomed me in their homes and their lives during fieldwork and my stays in Barcelona. *¡Muchas gracias! Eskerrik asko! Moltes gràcies! Un grand merci! Hvala vam! Tusinde tak!* I also praise myself very lucky for all the good advice I have received from friends, professors, colleagues and travel companions along this intense but pleasurable road, as well as for the swiftness and understanding of my favourite bookshop and photocopy service, Herminio. Part of this work has benefitted from the financial aid of the Spanish Secretariat of State of Culture and the (in-)material aid of *Quesos Suerte Ampanera*. I would also like to thank *Renfe* for installing sockets in their trains, as a significant portion of this thesis has been written in them. But, above all, I am greatly indebted to the wonderful and reassuring supervision I have received from my directors, Xavier Roigé and Oriol Beltran, which has gone further than the strictly academic. My visits to Barcelona would have not been the same without the immense hospitality of Oriol's family, our evening trips to the cinema and my furtive swims in the sea. Of course, all of this would have been impossible without the unconditional support of my family, which has gone well beyond the imaginable. Jesús, Irene, Raquel, Esther, Marion, Elsa: I cannot express how much I owe you for all the hours, day and night, I have not been able to be at your side. *¡Muchísimas gracias! Heel hartelijk dank! Aguyje!*

Vitae sal amicitia (Friendship is the salt of life)
Latin proverb

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Chapter 1

What is this thesis about: Objectives, methodology and structure

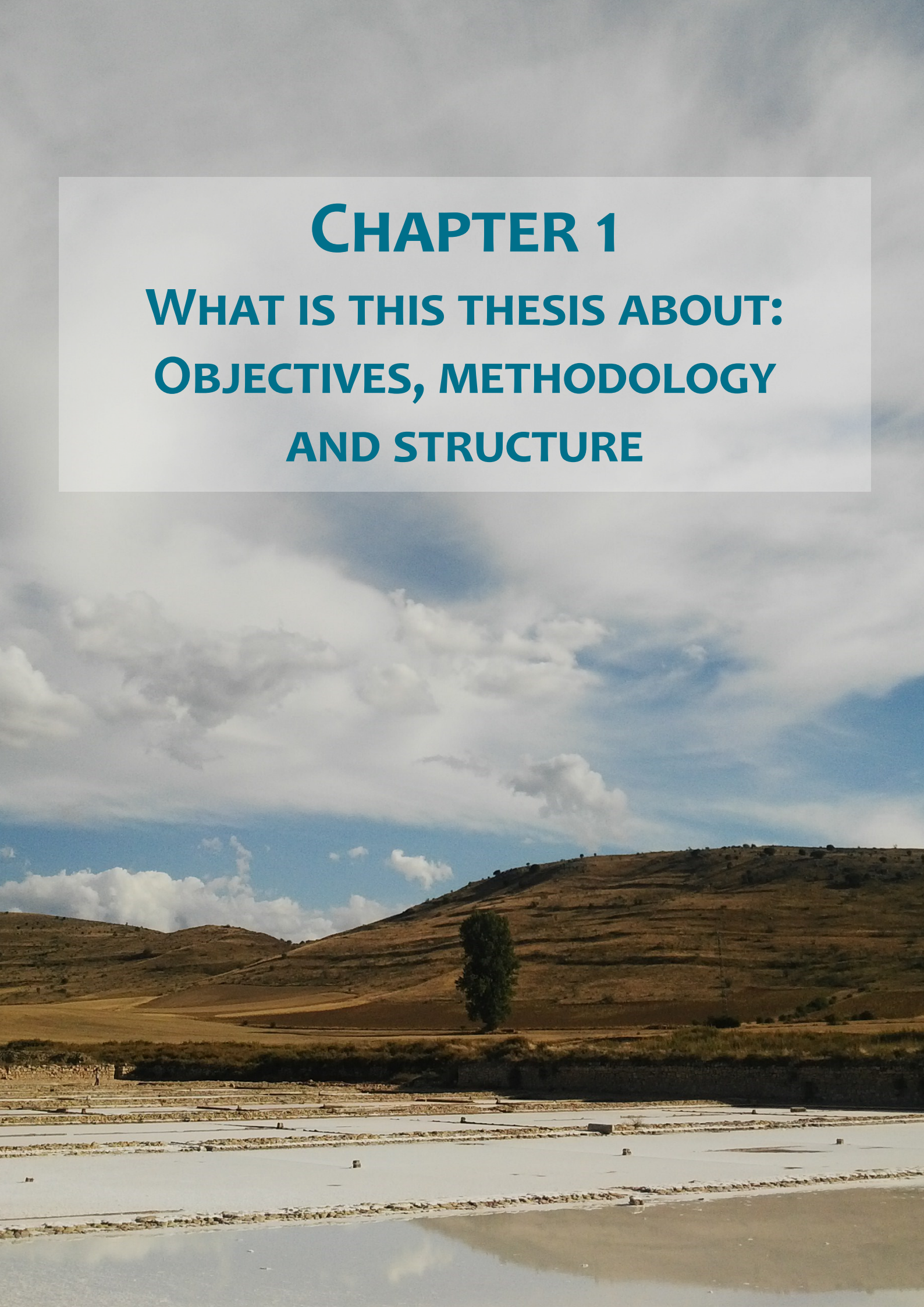


Table of Contents Chapter 1

1.1 Introduction

This thesis, entitled "'Salt in our veins': The patrimonialization processes of artisanal salt and saltscapes in Europe and their contribution to local development" tries to understand the process of change from the artisanal salt making process based on the business of salt to one based on the sound use of salt heritage and saltscapes. By understanding this process, it aims at identifying which factors contribute to success and how these can be applied elsewhere, whether (salt-based) rural heritage sites or natural (saline) landscapes and wetlands.

This chapter introduces the structural details of the thesis, starting from the different motivations that exist to do this research, the objectives, the research questions and the hypotheses, study sites and methodology. The motivation of this thesis is threefold: it hopes to attain a scientific advance in the issue of sustainable saltscape management and local development; it will provide an applied management model that can be used in the analysis of similar types of landscapes and heritage values and, finally, there is a strong personal commitment to saltscapes and salt heritage of the author. The objectives, questions and hypotheses that lead the research in this thesis move from a more theoretical to an applied character, evolving from the understanding of patrimonialization processes to the application of the lessons learnt. The second part of the chapter introduces the twelve study sites -nine in Spain and three in the rest of Europe- and justifies the choice of these sites according to different criteria, among others the cultural protection status (in the first group) and degree of success of their patrimonialization processes (in the second group). In the third part of the chapter, details about the methodologies used in the research are offered, including the worksheets of the indicators and the general guides for interviews. The work is based on a combination of qualitative methods such as bibliographic surveys, interviews, field visits and the use of a quantitative indicator-based tool. Also, the weaknesses and strengths of the methodology are discussed, to frame the limitations of this work. Together, they will form the patrimonialization narratives of the sites, which in the end will serve to understand what is the sustainable management of saltscapes. Finally, a summary of each of the chapters of the thesis is offered, to facilitate the reader a guideline of its full content.

1.2 Motivation of the thesis

This thesis has a multifaceted motivation. Firstly, it aims at covering a scientific gap in the study of cultural heritage and cultural landscapes, and more particularly, in the study of saltscapes. Secondly, it hopes to offer a management tool that could be applied in similar types of cultural and rural landscapes as well as in saltscapes located elsewhere. And, thirdly, it responds to a personal quest on the study and understanding of saltscapes, lasting already two decades. I will try to explain this threefold motivation in order.

Scientific motivation

The theme of the thesis cuts across several research areas. They key words of this work may be summarised in three: cultural heritage, landscape ecology and local development, touching thus the fields of interest of disciplines such as geography, ecology and social sciences. The physical location of interest in this thesis are traditional and artisanal salinas (i.e. salt making sites) and the relation to their social, cultural and natural hinterland. The

reason to choose this type of salinas as a paradigm is because they are productive landscapes that can contribute to the preservation of cultural heritage, of the natural values of the landscape and to the livelihoods of the local community, all of it while in operation. They do not need to suffer a radical transformation both at site level and within the local community's activities. Nor do they necessarily require a huge financial effort to recover and diversify their products and services. Salinas can do all this without altering their authenticity; they can be living landscapes and living heritage, provide a traditional, yet sustainable, livelihood and at the same time an opportunity to outreach the wider public, without the need of external support in the long run. That is, they can be paradigms of sustainability and local development.

Studies and works on cultural landscapes (e.g. thematic atlases, manuals, review works) hardly ever acknowledge saltscapes as landscapes with their own personality and value. Depending on the emphasis of the work, salinas will be considered rural, agrarian or mining sites and are shown merely as examples and not categories, if mentioned at all (Crespo 2010, Majoral *et al*. 2004, Mata *et al*. 2003, Molinero *et al.* 2014, Mücher *et al*. 2010, Sanz 2010). The scale is also relevant: few works understand saltscapes as a type of landscape that includes a salt making site and only focus on the site itself, ignoring the geographical, cultural and environmental backgrounds, which indeed explain its location. In addition, many works referring to the heritage of water or the management of water resources, generally ignore the presence of salinas. Both focus on freshwater, whether to disseminate the engineering principles of infrastructures, the historical management of irrigation waters, the balneotherapeutic uses of water or how freshwater is found in nature, to name a few examples (e.g. Bestué & González 2006, Frolova 2008, García-Llorente *et al*. 2012, Moreno 2012). Similarly, works referring to industrial or mining heritage tend to bypass salinas, especially the smaller, traditional ones, as their built environment or technical devices are not analogous to other industrial sites. A few works do mention saltworks as examples of such heritage, but do not consider them at landscape scale (Biel Ibáñez & Cueto 2011, Cañizares 2011, Puche 2003). Most of the works cited above refer to the situation in Spain, perhaps the richest country in Europe with respect to the abundance and diversity of saltscapes and salt heritage. Elsewhere in Europe, references to salt making sites in the literature on cultural landscapes and industrial heritage is scant. The first group is usually focused on the management of the natural values of saline coastal wetlands (e.g. Beltrame *et al.* 2013, Lai 2013, López *et al.* 2010a, Rodrigues *et al*. 2011 or most of the cases presented in Lauret 2015), whereas the second concentrates on industrial saltworks (e.g. Lageard & Drew 2015, Saurí-Pujol & Llurdés-Coit 1995, Wiewiorka *et al*. 2009). Again, they usually lack the holistic landscape perspective, except for the abundant French literature on the subject, especially on the Atlantic salinas, plus a few other works (Clément 1987, Ménanteau *et al.* 2005, Ménanteau 2012, Petanidou 2000, Reáult-Mille 2003; see also Chapter 6 for extensive bibliography). This thesis hopes to contribute to the acknowledgment of saltscapes as a cultural landscape in their own right and to consider them as a specific category with well-defined features.

The combination of disciplines chosen in this thesis is motivated by the fact that current research does not often look at these landscapes with a holistic, multi-disciplinary view, not even those related to the management of these sites (e.g. Evaristo & Botequilha-Leitão 2008, Ferreira 2010, Marques *et al.* 2009, Sovinc 2009, Tros de Ilarduya 2014). Although most scholar agree on the interactions between culture and nature in the shaping of landscapes or the role of heritage in local development and seldom find a balance between the role of tangible, intangible and natural assets, save a few exceptions (Antrop 2006, Blondel 2006, Ménanteau *et al.* 2005, Naveh 2001, Petanidou & Dalaka 2009, Vos & Meekes 1999). Empirical heritage studies usually focus on monumental heritage, often located in urban settings. Rural

development studies concentrate, on the other hand, on agricultural activities and seldom relate these to the cultural background originating them. Research on industrial or mining heritage related to salt is focused on the historical background of the heritage items and seldom takes a broader, landscape perspective (Albadalejo & Gómez 2016, Edwards & Llurdés 1996, Martín 2009, Melgarejo & López 2008, Moreno & López 2011). Their role on local development is translated in terms of tourism and rarely on endogenous activities, which should be less dependent on the provision of external resources. On the other hand, landscape scholars who do offer a holistic approach are often more interested in spatial management issues or in the biophysical features of the landscape, and rarely get down at ground level to study the detailed relations between nature and people within their sites (Bastos 2009, Martins *et al*. 2002). Hence there is also a flaw at the level of scale (from management design to its practical application). In general, there seems to be a lack of research on cultural landscapes that have a balanced, integrated view of all the aspects affecting their management and sustainability, including both natural and cultural factors and stressing both endogenous and exogenous development.

In any case, what is also missing in most of these studies is a historical perspective that may provide insight in how these landscapes have been shaped in recent times and how local stakeholders have been involved in the process[1]. This short-term historical perspective is needed to descend from general, overall guidelines established by the laws and agreements that may affect a site, to concrete measures that may be adequate for a specific location, without altering the spirit of these regulations. The main contribution of this thesis is the study of the patrimonialization processes in the selected study sites, to gain understanding of the drivers and challenges that affect each site at landscape level and how the latter have been overcome. To this end, a unique combination of methodologies has been implemented, namely a set of quantitative and qualitative research tools stemming from fields as wide apart as environmental science, ecology and social anthropology. This methodology, discussed in detail below, provides the unique opportunity to compare the narratives of the different study sites with qualitative, objective criteria. It allows to compare sites with very different socio-environmental features and provide understating in their evolution and future sustainability.

In summary, this thesis wants to fill these conceptual and methodological gaps by focusing on the intimate relationship between natural and cultural heritage occurring in saltscapes plus the implications of sustainable management practices at landscape, heritage and human levels.

Applied motivation

This thesis will draw its conclusions based on several practical examples. The study of the patrimonialization processes by means of the combined qualitative and quantitative methods explained below (see also Figure 1.3) will provide a methodological innovation that

[1] Paradoxically, abundant literature exists on the (pre-)history of salt making sites all over Europe and elsewhere in the world. Some references can be found in Chapter 3, although it is not the goal of this work to provide a thorough bibliographic review on salt history. Interested readers can refer to the 12 issues of the *Journal of Salt History*, which not only provide a wealth of articles, but also lists of related references in each of them. Despite this, historical research does not often cover recent (19-20th centuries) as much as older periods, although the knowledge of modern and contemporary events is quite relevant for the understanding of current challenges and difficulties and how these can be overcome in the future.

can be useful for the study of the patrimonialization processes of similar types of heritage and landscapes. Heritage research does not usually concentrate on the practical application of the outcomes, nor does it offer a methodological tool to apply elsewhere. This unique combination of methodologies stemming from different disciplines may allow the comparison between sites, types of heritage values or cultural landscapes and the evolution a given site or heritage asset. The strength, simplicity and clarity of objective quantitative indicators will be complemented by the depth, flexibility and understanding that comes along with the study of narratives by personal interviews, field visits and bibliographic analysis.

But especially relevant from the point of view of potential applications is the proposal of a saltscape management model that stems from the conclusions of this work. As will be explained in subsequent chapters, saltscapes are a very specific type of cultural landscapes, in which complex socioeconomic situations exist in a peculiar natural environment. They are productive landscapes, often managed with industrial criteria but operating more as agricultural activities (Carrasco 2017). The natural environment is a key factor, as salt determines not only the presence of certain species and habitats but also the ecosystem they form. Typical management plans for these sites are usually skewed towards the natural or the built heritage and very few acknowledge the role of the local community. In the first category fall the management plans for the Natura 2000 sites, compulsory by law. Even where management models have been proposed, they tend to keep a bias towards the top-down protection of natural values. This also includes other plans for natural protected areas. In the second category, they mostly are rehabilitation plans for the architectural values of the site. These will be discussed in Chapter 4. Hence, this thesis will devote a few pages to propose a management model that not only serves saltscapes as complex cultural landscapes, but also many other types of cultural landscapes based on a tight connection with nature and with the local community.

Complementary to the management model, several analysis tools will be used or at least proposed, so that managers in other sites can apply them for the analysis of their own situation. The model is open to add-ons or to innovation; what will be offered here is the spirit of what has been identified as useful and positive, not only in the study sites, but as identified in the literature or elsewhere, from my personal and professional experience. In the study of patrimonialization processes and the reconstruction of the sites' narratives, good practices, threats, challenges and pitfalls will be identified. This collection of experiences will be filtered and streamlined so that they can serve others as examples (not) to follow. Hence, not only the model will be offered, but also a series of steps towards sustainable management practices, that can be useful for other types of landscape or heritage values. These will be analysed and proposed in the last chapter of the thesis.

Personal motivation

Given the profound personal implication I have with the subject of this thesis, I would like to devote a few words to explain the reader my path through salt. My great-grandfather was one of the 13 businessmen acquiring the *Condominio de las Salinas de Imón y La Olmeda* in Guadalajara after its release during the privatisation of most of the salinas in Spain in 1869 (see Chapter 5). After a family visit to the site, honouring my father's recent demise in 1994, I became fascinated by this landscape in decay. Two years later, I had managed to organise and coordinate a summer youth camp, aiming at consolidating the two main storage buildings in Imón, named San Antonio and San José. This experience allowed me to meet

several people interested in the preservation of salt heritage in the area and became the seed of the Association of Friends of Inland Salinas, which I was kindly invited to chair. Almost one hundred people came to the inauguration of the Association, celebrated on a cold December morning in Sigüenza in 2002. In the first years, its goal was the recovery of the salinas in the area, and had an activist approach, with numerous leisure activities, which obtained a certain relevance in the press, and many visits to policy makers and public administrations. However, political unwillingness and administrative burdens made us hit the wall and shift interest towards a more academic activity. A word of thanks should be said here for professor Theodora Petanidou, who firmly believed in my capacity to move in this direction, when we met, back in 2002 at the ALAS final conference in Mytilene. Thus, the Association started organising courses, conferences and research work, publishing the results and presenting them in other specialised events. It also started to meet other scholars and activists and investigate the situation of salt heritage elsewhere. Soon it became involved in international heritage recovery projects, such as Interreg *Salt of the Atlantic* and Interreg *Ecosal Atlantis* (see Chapter 4). Besides from our own research projects or others in which we were invited to participate, the association has been requested to provide technical assistance for the recovery and use of salt heritage, as well as the dissemination of their values via publications, events or *in situ* equipment. In 2007, the specialised salt-related journal *El Alfolí*[2] was born, which has reached its 20th issue in 2017, with 1,600 readers worldwide up to date.

At the 10th anniversary of the Association of Friends of Inland Salinas, in 2012, the name was transformed into the *Institute of Saltscapes and Salt Heritage*, IPAISAL, which better reflected our commitment with the natural and cultural heritage of salt at a global scale. In these years, we have produced 10 books and book chapters, eight peer-reviewed articles, 50 articles in conference proceedings, six scientific posters, two documentaries, 20 courses and conferences and numerous other events such as exhibits, guided visits or salt tastings (all to be consulted in IPAISAL 2017). Many of these works have been authored by myself and presented in technical and scientific venues, as can be seen in the references. Thanks to this activity, I have been invited to participate in several scientific and evaluation committees (*Ramsar Culture Network, IUCN, EU's Biodiversa research fund,* SEDPGYM-*Sociedad Española de Patrimonio Geológico y Minero, Interreg Terra Salina project*) and am member of several professional associations (*INCUNA-Asociación Industria, Cultura y Naturaleza, TICCIH-The International Committee for the Conservation of Industrial Heritage, Hispania Nostra, International Society of Salt Lake Research, IALE-International Association for Landscape Ecology Europe…*). But what I am perhaps most proud of, given their deeper significance, is my nomination as honorary member of the *Asociación La Sabina* in Arcos de las Salinas and the *Jurade du Sel* in Salies de Béarn, in France. Sparked by this dual personal and professional interest, I truly hope to awaken the passion of the reader in all things salt. May you become stung by the salt-bug, just like many of my enthusiast informants and collaborators have been!

Both the scientific and applied motivation have proven to raise more questions than answers, which feeds my personal quest on salt-related knowledge and beyond. Ideas for further research are thus provided at the end of the text.

[2] All issues of *El Alfolí* can be consulted here: URL: https://upco.academia.edu/KatiaHueso/El-Alfol%C3%AD

1.3 Objectives & hypotheses

1.3.1 Objectives

The main objective of the thesis is to *analyse the factors that contribute to the sustainable management of salt heritage and saltscapes and how these lead to local development*.

The complexity of the study object, its multi-scalarity (from landscape to heritage, to community), the multifunctionality of the landscapes and the geographical dispersion of the study sites, force the choice of multiple objectives, which feed the subsequent research questions and hypotheses. These are explained below.

Also, provided the dual scientific/applied motivation of this thesis, the objectives can be divided in these two main categories. These secondary objectives stemming from the above main goal, can be classified as follows:

Table 1.1: Secondary objectives of the thesis, related to research questions and hypotheses

Secondary objectives	Character	Subquestion, Subhypothesis
To understand the role of protection measures on the heritage and landscape-based local development	Scientific	1
To understand the process of patrimonialization of salt heritage and the drivers that steer it	Scientific	2
To describe the products and services offered by saltscapes compatible with the preservation of heritage and the livelihood of the local community	Scientific	3
To identify the good practices (and malpractices) performed in the sound use of salt heritage and saltscapes and their influence in local development	Scientific/ Applied	2,4
To describe the challenges and pitfalls in the sustainable management of saltscapes and salt heritage	Scientific/ Applied	2,4
To offer a management model that can be applied in other salt-making areas and even in other forms of rural heritage or wetland areas	Applied	N/A

Source: Own elaboration

1.3.2 Research questions and hypotheses

The main research question and hypothesis is directly related to the main objective. With this question, I hope to obtain a direct answer to if sustainable local development in saltscapes is at all possible and, if yes, what is needed to achieve so. The details will be broken down in the sub-questions and sub-hypotheses presented below.

Box 1.1: Main research question / hypothesis

Main research question:	How can the management of saltscapes and salt heritage contribute to sustainable local development?
Main hypothesis:	It can be proven that the sustainable management of saltscapes -as a type of cultural landscape that hosts relevant natural and cultural heritage values- actively contributes to local development. However, this can only be achieved with a holistic, innovative, multidisciplinary and participatory approach.

The protection of landscapes and heritage assets is a common tool to ensure their continuity in time and to preserve their most important values. The question here is whether the protection of saltscapes influences the development of the area or is it an independent factor. In case the legal protection of a site affects the local development of the area, is it positive or negative? And is there a direct correlation? How do other factors interact with the protection?

Hence:

Box 1.2: Subquestions 1 / hypothesis 1

Subquestions 1:	How can the protection of saltscapes contribute to the local development and ecotourism of their hinterland? Does the protection of their natural and cultural values enhance their chances of success?
Hypotheses 1:	The legal protection of the natural and cultural values of saltscapes is often a protection on paper. It does not have a relevant role in the initial success of the conservation, dissemination and local development but may support them once initiated by other factors.

The understanding of the patrimonialization process of a site may provide a useful perspective on the factors that have a role in the success or failure of local development strategies. By studying these processes, the challenges, difficulties, pitfalls and take-home lessons can be identified. Also, those factors that may have a key vs. a secondary role can be identified, or those managers can have an influence on vs. those that cannot be changed.

Box 1.3: Subquestions 2 / hypothesis 2

Subquestions 2:	How are saltscapes and salt heritage patrimonialized? What are the challenges and pitfalls along the road? Who and what triggers and drives the process?
Hypotheses 2:	There are different patrimonialization processes that may lead to success. Although drivers and challenges may vary considerably, a general pattern of events can be recognised.

Sustainable local development depends on a balanced choice of products and services that provide a livelihood to the local community, while preserving the natural and cultural values of the site. Does an ideal combination of products and services of saltscapes exist? Can there be a balanced combination of development and preservation in these sites? What are they based on?

Box 1.4: Subquestions 3 / hypothesis 3

Subquestions 3:	What types of products and services can saltscapes offer? Which of them are compatible with the conservation of their natural and cultural values? Which contribute to the local development of the area?
Hypotheses 3:	Saltscapes can offer a broad range of products and services that are compatible with a sound development and conservation, and compatible among each other.

Finally, the success of a site in the choice of a sustainable development strategy largely depends on an adequate management. Is there a key model of management or are there only good management practices? Can these be "exported" to other sites? What other factors may a successful sustainable development depend on?

Box 1.5: Subquestions 4 / hypothesis 4

Subquestions 4:	What good practices exist in the sound management of saltscapes? How does it contribute to the conservation and dissemination of their values? And to the livelihood of the local community? What factors does the success depend on?
Hypotheses 4:	The successful initiatives in the sound recovery of saltscapes depend on a complex relation between its intrinsic features or the potentially favourable conditions in its hinterland, as well as serendipitous factors beyond the control of managers.

As can be seen, there is a certain overlap from one set of questions and hypotheses to the next. If the main objective and research question is kept in mind, a logical flow of events and factors can be found in the order of the sub-questions and sub-hypotheses offered. There is also a subtle flow from more scientific sub-questions and sub-hypotheses to more applied ones. From understanding comes insight and from there, the conviction that allows sharing the knowledge with others.

1.4 Geographical framework – Selection of case studies

1.4.1 Selection of case studies

The reasons to select traditional salinas as the geographical and thematic reference for this thesis are hinted above. Salinas epitomize the complexity of cultural landscapes, in which human, cultural and natural features are intimately linked and are mutually dependent in order to achieve and maintain sustainability. In addition, salinas are or can be living landscapes without the need to change them into surrogate or fossilized "heritagescapes".

This strength of salinas has also been its weakness. Landscape scholars have had difficulties to classify them into thematic or sectorial atlases or reference works. They have also been

ignored as wetlands, because of their little use in the provision of freshwater and the inconspicuousness of their natural values. The built heritage in salinas is pragmatic, modest and, due to the materials used, is easily degraded, hence not calling the attention of architects and other heritage specialists. Salt making is an activity halfway related to mining, but without the allure of underground, risky work; and agriculture, but without its visible implications in food culture and identity; hence of less interest to social scientists. Salinas are always halfway, for better or worse. In this thesis, I will rather stick to the first.

Alas, changes in society and history in the past decades or even centuries, have motivated the disappearance of numerous salt making sites worldwide. No comprehensive studies on the abandonment of salt making and salinas have been made, but some partial inventories performed in different European regions, can give an indication of the degree of heritage loss associated to salt making (see Table 1.2). With all the necessary precautions when comparing such studies, in most cases, a loss of around 90% has been registered. By all measures, this is a serious threat to the remaining sites. Those which have not been transformed into industrial salt works (e.g. roughly half of the remaining coastal sites in Spain), are under threat of abandonment. This thesis looks at those sites that have been able to shift from a merely productive activity to a heritage-based multifunctional landscape. Processes, outcomes and good practices in the sustainable management of the site are looked at.

Table 1.2: Evolution of the number of salt making sites in certain regions of Europe

Region	Past	Today*	% of heritage loss
Spain and Portugal[1]	517 inland salinas 182 coastal salinas	ca 45 inland salinas ca 30 coastal salinas	91% (inland salinas) 84% (coastal salinas)
Germany[2]	115 seething facilities	5-10 seething facilities	91-96%
Greece[3]	356 salinas	178 salinas	50%
Mediterranean basin[4]	4,000 salinas	170 salinas	99,5%

*Operating or in reasonable state of conservation

Sources: Own elaboration, with data from: [1]Carrasco & Hueso 2008a, [2]Emmons & Walter 1988, [3]Petanidou & Dalaka 2009, [4]Luengo & Marín 1994, [4]Sadoul *et al.* 1998, own data.

Although some authors criticize the use of case studies as a basis for building knowledge, it is a well-known fact that expertise comes from the "context-dependent knowledge and experience" (Flyvbjerg 2006). Understanding patrimonialization processes, as I hope to do, cannot be done without a proper knowledge of the sociocultural, historical and natural contexts. The saltscapes selected here should serve as examples of patrimonialization processes with different (whether desired or not) outcomes and very diverse ways and means to reach them.

The selection of case studies has been supported by previously existing information on the sites, and thanks to my previous personal and professional implication with some of them. This can be also seen as a threat to impartiality, but the gain in overall insight seems to me more beneficial. The study cases selected here try to represent different models of successful or partially successful patrimonialization processes and outcomes in traditional salinas.

The selection of all cases responds to one criterion, that is, whether the sites are or have been in the process of patrimonialization. This means that the selected sites do not only produce salt (in case they do), but also have other areas of economic activity focused on the public: tourism, health services, or educational activities.

In the case of Spanish sites, an additional criterion has been that the nine sites were the only inland salinas protected as a BIC (*Bien de Interés Cultural* or Good of Cultural Interest), a

protection measure provided by law[3], at the start of this work (fall 2014). The reason to choose this protection measure is that it acknowledges not only the cultural values of the site, but also its historical process. In some of these cases, the natural values are also protected. On the other hand, many (former) salt making sites are protected for their natural values, but these are acknowledged *in spite of*, rather than *thanks to* the salt making activity. For this reason, within the context of this work, the natural protection instruments will be analysed only on those sites where there is the dual cultural/natural protection.

The cases chosen elsewhere in Europe respond to a more empirical criterion. These are sites known for their successful management of the artisanal salt making activity in a balanced combination with the protection of natural and cultural values, as well as the provision of a livelihood for the local community. There surely are more cases in Europe[4], but these are representative of very different processes and may act as paradigms for others.

The process of patrimonialization and its outcomes can be somewhat simplistically explained in Table 1.3. It reflects the main features of a salt making site during its operation as such and after it has been transformed into a heritage site. Normally, patrimonialized heritage sites are do not fully belong to one or the other category, but find themselves somewhere within this gradient.

Table 1.3: Hypothetical main features of saltscapes before and after a completed patrimonialization process

Features	Before	After
Type of activity	Extractive	*Saliniculture*[5]
Type of landscape	Productive	Cultural
Main stakeholders	Workers Company Public administration	Owner / Manager NGOs / Trusts / Public admin. Residents / Visitors Society in general
Products and services	Salt Salt by products	Heritage (including salt) Landscape

Source: Own elaboration

Similarly, the salt making sites studied will not find themselves in any of these two situations, but rather somewhere in between. The rationale behind studying them is to understand how far they have got in the process, how they have achieved this and why the process may have stagnated. The case studies should serve as an example of successes but also of lessons learnt on the road. The European cases selected to be studied in depth also have in common that the patrimonialization process is found in an advanced stage and can serve as an example or paradigm for others. In addition, these sites produce salt by traditional methods, reinforcing the idea of heritage conservation and transmission. The three areas are thriving

[3] *Ley 16/1985, de 25 de junio, del Patrimonio Histórico Español* (Act 16/1985 of Spanish Historical Heritage)
[4] Places such as Aveiro, Figueira and Rio Maior (Portugal), Bay of Cádiz and Biomaris (Spain) or Cervia (Italy) pop to mind, but might lack the solidity of the sites chosen.
[5] *Saliniculture* is a term that combines "salicultura" (in Spanish) and "salinicultura" (in Portuguese), which both mean "the cultivation of salt". However, the word "salinicultura" in Spanish could also mean "the culture of salinas", which is what I intend to say with this word, albeit very roughly translated into English. It is meant to reflect the intimate relation between heritage, landscape and the salt making activity itself.

examples of heritage recovery at regional level and are well known in an international scope[6]. Having said this, the sites differ considerably from each other in their past and recent history and how the process is driven. Some key features of the sites are summarised in Table 1.4, and a brief introduction to each of them follows below.

Table 1.4: Main features of each of the cases studied

Site	Threats it faced	Ownership and management	Process (driven by)	Main activity	Secondary activities	Best known heritage asset
Sites in Spain						
Añana	Abandonment	Public (trust)	Top-down (public admin.)	Tourism, salt making	Wellness	Ethnographical & built heritage
Arcos	Abandonment	Private (individual)	Horizontal (municipality)	None	None	Built heritage
Espartinas	Abandonment	Private (individual)	Bottom-up (civil society)	None	None	Archaeological remains
Gerri	Abandonment	Private (individuals)	Horizontal (municipality)	Tourism	Salt making	Nature & landscape
Imón	Abandonment & misuse	Private (industrial consortium)	Bottom-up (civil society)	Industrial salt making	None	Built heritage
Peralta	Abandonment	Private (individual)	Horizontal (municipality)	None	None	Built heritage
Poza	Abandonment	Private-Public (individuals and municipality)	Bottom-up (civil society)	Salt making	Tourism	Ethnographical & built heritage
Rambla S.	Abandonment	Public (regional admin)	Bottom-up (civil society)	Tourism	Salt making	Nature (birds, wetland)
San Juan	Abandonment	Public (trust)	Horizontal (municipality)	Salt making	Tourism	Nature (geology)
Sites in the rest of Europe						
Guérande	Speculation	Cooperative (salt makers)	Bottom-up (civil society)	Salt making	Nature Tourism	Nature (birds, wetland)
Læsø	Lost know-how	Corporate (SME)	Horizontal (municipality)	Salt making	Tourism Wellness	Ethnographical & built heritage
Sečovlje	Abandonment & change	Corporate (transnational)	Top-down (private sector)	Tourism	Salt making Wellness	Nature (birds, wetland)

Source: Own elaboration

1.4.2 Inland salinas protected as BIC (Spain)

Recent surveys have detected references to almost 1,000 different saltscapes in Spain and Portugal, three quarters of which had been or still are devoted to the production of salt, the rest being naturally occurring saline lakes and streams (Carrasco & Hueso 2008a, Hueso & Carrasco 2009a). Of these, approximately 500 (former) solar evaporation salt making sites are located inland. Such an abundance and diversity of saltscapes is unheard of in a relatively small territory and certainly so within the European context: inland solar evaporation salt making sites are in fact unique to this area. Hence, one could speak of inland salinas as an Iberian endemism. Among those hundreds of sites, very few (ca. 20-25) still actively produce salt or at least are being taken care of, with different degrees of success and very different approaches (see Table 1.5). In some cases the sites are being recovered with the prospect of salt production and in some others their heritage values are being recovered and shown to the public, yet in others totally new uses are applied. Up to date, 9 inland salt making sites have been protected as BIC and ca. 20 are located within a natural protected area. Most of the sites that have been protected in some way or the other are actively being recovered or

[6] As Heidegger puts it, "you recognize a paradigm case because it shines" (Flyvbjerg 2006)

plans exist to do so. Hence, these salinas lend themselves well to the study of patrimonialization of salt heritage and saltscapes.

Although the sites differ very much from each other (see Figure 1.1), the do share certain common features. The productive area is relatively small, from a few to 10-12 hectares (the biggest being Imón, Poza de la Sal and Imón). Some lie on flat terrain (Imón, Rambla Salada, San Juan), on the flat -although sometimes narrow- bottom of a valley (Arcos de las Salinas, Gerri de la Sal, Espartinas) or using the nearby slopes as productive terrain (Añana, Poza de la Sal, Peralta de la Sal). The diversity of terrains and the geographical spread of the study sites has made them very diverse from the point of view of built heritage. Buildings and infrastructures have been made following local traditions and using the materials available locally, which confer them very different aspects. Also, the salt making traditions, work rituals and even vocabulary are very diverse, as they depend on the traditions and uses of the local community of the site.

Historically, all of them were in operation before the general privatisation, many of them for centuries already. However, given their limited productivity, geographical isolation and weather dependence, they became victims of the standardisation and easy distribution of cheaper salt and were progressively abandoned during the 20th century. Depending on the date of abandonment and the vulnerability of the infrastructures, the state of the salina may vary considerably. In some cases, the situation of ruin is almost total, such as Espartinas, whereas in others, recovery may still be possible (as of today), such as Imón or Peralta de la Sal. In other cases, the site is operating, at different degrees of intensity. The most developed site is Añana, with a healthy salt making activity, whereas others are starting to produce salt again modestly, such as Rambla Salada or Poza de la Sal.

The sites are usually found in saline environments, which are not so suitable for other agricultural uses except extensive cereal or pasture. Their natural values are usually identified as saline habitats (Hidalgo 2005), or are represented by certain endangered species of plants or invertebrates, as recognised by the Habitats Directive and the corresponding national and regional Red Books and Atlases. Some of the sites lie therefore within natural protected areas of different kind (Añana, Espartinas, Imón, Rambla Salada, San Juan). Given their small size, they do not host abundant bird communities, although they may attract individuals or breeding pairs of certain interest.

There are several other inland sites of interest, but have not been chosen as study sites for the reasons mentioned above. However, in the analysis of the results, I will consider the knowledge and experience I have from them. Examples of these sites are Cambrils in Lleida, Salinas de Oro, in Navarra, Iptuci in Andalusia or Rio Maior in Portugal. Coastal salinas in Spain and Portugal also offer a wealth of different situations, and in some cases, their patrimonialization processes may be worth considering at the discussion phase. Some of them may be Biomaris and Bay of Cádiz, in Andalusia; Ria de Aveiro or Figueira, in Portugal; Cervia, in Italy, or some of the industrial sites in the Mediterranean. Table 1.5 provides an overview of the salinas with some degree of patrimonialization in Spain and Portugal (see also maps in Annex 3)[7], which will be considered for discussion. Except for the case studies chosen, marked in bold, none of them have been researched in depth for the purpose of this thesis and only previous information and personal experience in them are used.

[7] Sites elsewhere in Europe are not considered in this table, given the difficulty in obtaining updated and reliable information.

Table 1.5: Overview of Iberian salinas with some degree of patrimonialization

Name of the site	Protection		In production	Open visitors
	Natural	Cultural		
Atlantic sea salt				
Aveiro (Portugal)	X		Artisanal salt	X
Biomaris (Huelva)			Artisanal salt	
Castro Marim (Portugal)	X		Artisanal & industrial salt	X
Figueira (Portugal)			Artisanal salt	X
La Covacha (Cádiz)	X		Demonstration	X
La Tapa y Marivélez (Cádiz)	X		Industrial salt	
San Vicente (Cádiz)	X		Artisanal salt	X
Santa María de Jesús (Cádiz)	X		Demonstration	X
Mediterranean sea salt				
Cabo de Gata (Almería)	X		Industrial salt	X
El Rasall (Murcia)	X		Demonstration	
Es Trenc (Balearic Is.)	X		Artisanal & industrial salt	X
Ses Salines (Balearic Is.)	X		Artisanal & industrial salt	X
La Trinitat (Tarragona)	X		Industrial salt	X
Torrevieja (Alicante)	X		Industrial salt	X
Santa Pola (Alicante)	X		Industrial salt	X
San Pedro del Pinatar (Murcia)	X		Industrial salt	X
Canarian salinas				
Los Agujeros (Lanzarote)		X	Artisanal salt	
Arinaga (Gran Canaria)		X	Artisanal salt	
Bocacangrejo (Gran Canaria)			Artisanal salt	
Bufadero (Gran Canaria)		X	Artisanal salt	X
Carmen (Fuerteventura)		X	Demonstration	X
La Florida (Gran Canaria)			Artisanal salt	
Fuencaliente (La Palma)	X		Artisanal salt	X
Janubio (Lanzarote)	X	X	Artisanal salt	X
Tenefé (Gran Canaria)		X	Artisanal salt	X
Inland salinas				
Arcos de las Salinas (Teruel)		**X**		
Armallá (Guadalajara)	X			X
Belinchón (Cuenca)			Brine	
Cambrils (Lleida)				X
Duernas (Córdoba)			Artisanal salt	X
Espartinas (Madrid)	X	**X**		
Fuentealbilla (Albacete)	X			
Gerri de la Sal (Lleida)			Demonstration	X
Imón (Guadalajara)	X	**X**	Brine	
Iptuci (Cádiz)	X	**X**	Artisanal salt	X
La Malahá (Granada)				
La Olmeda (Guadalajara)	X			
Peralta de la Sal (Huesca)		**X**		X
Poza de la Sal (Burgos)		**X**	Demonstration	X
Rambla Salada (Murcia)	X	**X**	Demonstration	X
Rio Maior (Portugal)			Artisanal salt	X
Salinas de Añana (Álava)	X	**X**	Artisanal salt	X
Salinas de Oro (Navarra)			Artisanal salt	X
Sangonera (Murcia)		Requested		
San Juan (Guadalajara)	X	**X**	Artisanal salt	X
Vilanova (Lleida)			Demonstration	X
Saline wetlands with past salt production				
Chiprana (Zaragoza)	X			X
Fuentedepiedra (Málaga)	X			X
Gallocanta (Zaragoza/Teruel)	X			X
La Mancha (Toledo/Ciudad Real)	X			
Villafáfila (Zamora)	X			X

Source: Own elaboration

Salinas de Añana

Salinar de Arcos de las Salinas

Salinas de Espartinas

Salí de Gerri de la Sal

Salinas de Imón (old below, new above)

Salinar de Peralta de la Sal

Salinas de Poza de la Sal

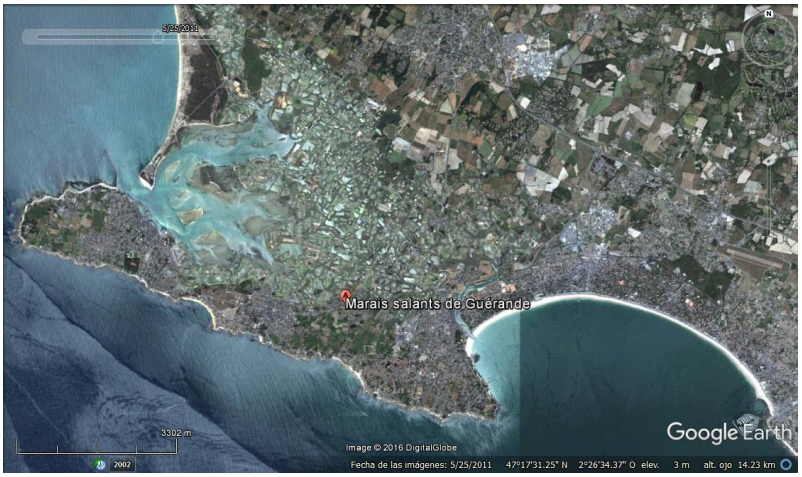
Salinas de Rambla Salada

Salinas de San Juan

Figure 1.1: Aerial photographs of the nine study sites in Spain (beware, scale may vary). Detailed photographs of the sites can be found in Chapter 5 (Source: Own elaboration, with photos ©GoogleEarth).

1.4.3 Study sites in Europe

The study sites in Europe will be presented individually, as they have very different backgrounds and features. Figure 1.2 shows aerial views of the three sites.



Marais salants de Guérande (France)

Læsø saltworks (Denmark)

Sečoveljske soline (Slovenia)

Figure 1.2: Aerial photographs of the study sites in the rest of Europe, with the approximate location on the map of each country. Detailed photographs of the sites can be found in Chapter 6 (Source: Own elaboration, with photos ©GoogleEarth).

Marais Salants de Guérande, Loire-Atlantique (France)

The Guérande salt marshes (47°17' N, 2°27' W, 0 m a.s.l.) are located in the southern half of Brittany (France) between the mouths of the rivers Loire and Vilaine, facing the Atlantic Ocean. They form a very large wetland zone in western Loire-Atlantique and occupy a surface of 2,000 hectares.

Salt has been harvested on the peninsula since the Iron Age. The first salt works to use the storage capacity of the lagoon goes back to the 3rd century, shortly after the Roman conquest. The first salt marshes as are known today were shaped by the monks from Landévennec Abbey, who, in 945, carved them out by studying the tides, wind and sun. The salinas brought prosperity to Guérande for many centuries and opened up the first trading routes in Europe. Today, at least five salt works from the Carolingian period are still in operation. After a period in the mid-20th century in which the salinas were threatened with urban sprawl, certain sectors of civil society sensitive to the cultural and natural values of the site managed to stop this threat and recover the salt marshes as they had always been. The tradition of the salt worker's profession was recovered and the preservation of these skills have allowed the Guérande marshes to survive through to modern times. Today, around 16,000 tonnes of coarse salt is produced each year but only 700 tonnes of *fleur de sel*.

The Guérande salt marshes present abundant and diverse flora and fauna. The shallow water allows light to reach to bottom of the ponds, warm the clay and favour the development of plankton, which is the vital foundation of the food chain in the marshes. This large supply of food, combined with a mild climate, makes the Guérande site a favourite over-wintering and reproduction site for birds and over 280 species of migrating birds pass through every year. The site is also rich in halophytes, with glasswort being most popular among gourmets.

The salt marshes on the Guérande peninsula were awarded the *Label Paysage* in 1992, have been listed as a *Zone Naturelle d'Intérêt Écologique, Floristique and Faunistique (ZNIEFF)* (Site of Special Interest) by the French Government since 1991 and as a *Zone Importante pour la Conservation des Oiseaux (ZICO)* (Bird Protection Area) under the 1979 European directive on Birds. Since 1995, the salt marshes have been protected as wetlands of international importance under the Ramsar convention. Finally, the site forms part of the European Natura 2000 network and is candidate to Biosphere Reserve by UNESCO.

Sečovlje Salinas, Piran (Slovenia)

The Sečovlje salt pans (45°29' N,13°36'E, 0 m a.s.l.) are located in the south-west part of Slovenia, next to the border with the Republic of Croatia and consists of two parts. Its northern part, where salt is still being actively produced and harvested, is known as Lera. The southern part, called Fontanigge, is separated by the Grande - Drnica channel.

The Sečovlje salt pans are today the largest coastal marsh wetlands (650 hectares) in the country, and at the same time the most important Slovenian locality from the ornithological point of view. Today, 272 bird species have been found in the Sečovlje salina, with some 90 breeders among them. On the basis of these facts, the Government of the Republic of Slovenia in the year 2001 declared the Sečovlje Salina Natural Park and the adjacent Museum of Salt-making as a cultural monument of national importance. In 1993, the salinas became the first Slovene wetland, inscribed on the list of internationally important marshes under

the auspices of the Ramsar convention. The salina represents different ecosystems, from marine to brackish, fresh water and land ecosystems.

The traditional manual harvesting of salt in these salinas, over 700 years old, is a representative feature of the cultural heritage of Mediterranean Slovenia. Until the beginning of the 20th century, the saltworks were owned by wealthy families, churches, monasteries and charitable institutions. The salt worker was merely the tenant of the salt field and the producer of the salt. The golden age of salt making in Sečovlje lasted from the 15th century to the end of the 18th century, under the control of the Venetian Republic. In 2000 the Sečovlje Salinas Nature Park was designated the first protected area in Slovenia where the concession for its management has been given to a business company (SOLINE Pridelava soli d.o.o.), which is owned by the national biggest phone company (Mobitel d.d.). The company is responsible for the management of the state designated Nature Park and use of its natural resources. The company also is responsible for the protection of nature in the state-owned property of the Sečovlje Salina Nature Park. In return, the Republic of Slovenia provides funding for the management of the protected area. Their salt is well known in the Eastern Mediterranean and the site constitutes an example of good management practices and smooth transition from a communist to a capitalist economic system.

Læsø Saltworks, Northern Jutland (Denmark)

The Læsø salt works (57°15' N, 11°2' W, 0 m a.s.l.) are located in the south-east of the island Læsø in northernmost Denmark. Salt is being produced by seething, using wood as fuel. The brine is pumped from the salty water table of Rønnerne, in the nearby sandbanks of the southern edge of the island. This brine is twice or three times as concentrated as seawater and was collected in wells to be further concentrated. The brine was then boiled or seethed to obtain a product of high-quality, equal to the famous as the salt from Lüneburg.

In the Middle Ages the Læsø salt works were the most important workplace of the island and were considered the first industry of the time. Salt production stopped in 1652 because seething salt in the huts required large amounts of biomass. By then, the salt industry had used up all the fuel wood on the island and the island was transformed into a windswept desert. Salt was still made occasionally from brine as a cottage industry until the middle of the 19th century. The ruins of the old huts where the salt was boiled are still standing as low, square embankments. There are an estimated 1,000 of them on the island.

Archaeological research in the mid-20th century revealed how salt making was done a few centuries ago. In 1991 a municipal employment project allowed the reconstruction of salt making huts and the restart of the salt making activity in the island, according to 16th century methods. The island has large enough forests where firewood and wooden chips can be harvested. Læsø Saltworks uses between 1,000 – 1,500 cubic meters of firewood every year, less than 10% of the current harvest of forest products, well below the limit of sustainability. Today the salt making activity is highly organized and successful. The saltworks are making an important contribution to the economy of Læsø. As a tourist attraction, the salt works receive over 60,000 visitors per year. The salt works produce ca. 70 tonnes of salt per year, selling both locally as all over Scandinavia. The salt is highly valued by customers and visitors and has become a culinary reference in high-end restaurants in the region.

There is no official protection status for the salt works. Plans by the Danish Government to declare the island as a maritime national park were dismissed by the local community.

1.5 Methodology

The methodology used for the research of the selected case studies is based on a combination of qualitative methods (bibliographic survey, field visits, focus groups and in-depth interviews) and a quantitative assessment tool (indicators), as shown in Figure 1.3. The combination of methods provides a simple and, objective, yet deep insight on the patrimonialization process of each site. It not only offers a picture of the current situation a given site is undergoing, but includes the recent history of the landscape and the community in relation to the site. This is very valuable information to understand how the current situation has been reached and how successes and failures have taken place. The qualitative methods reflect the complexity of the management of saltscapes, but also provide information needed for the indicator-based tool, which feeds on a combination of the three. Both the quantitative and the qualitative analysis sum up the narrative of the site; which, in other words, is the story of its patrimonialization.

At a broader scale, the idea behind this combined methodology is to obtain a set of information that gives an accurate picture on what is happening at site level, allowing at the same time a certain degree of comparison or categorization among them. And, perhaps even, to compare with other patrimonialization processes, outcomes and good practices elsewhere. As Flyvbjerg (2005) expresses, it aims to provide "food for thought for the ongoing process of public deliberation, participation and decision making".

Each of the methods used is described in some detail below.

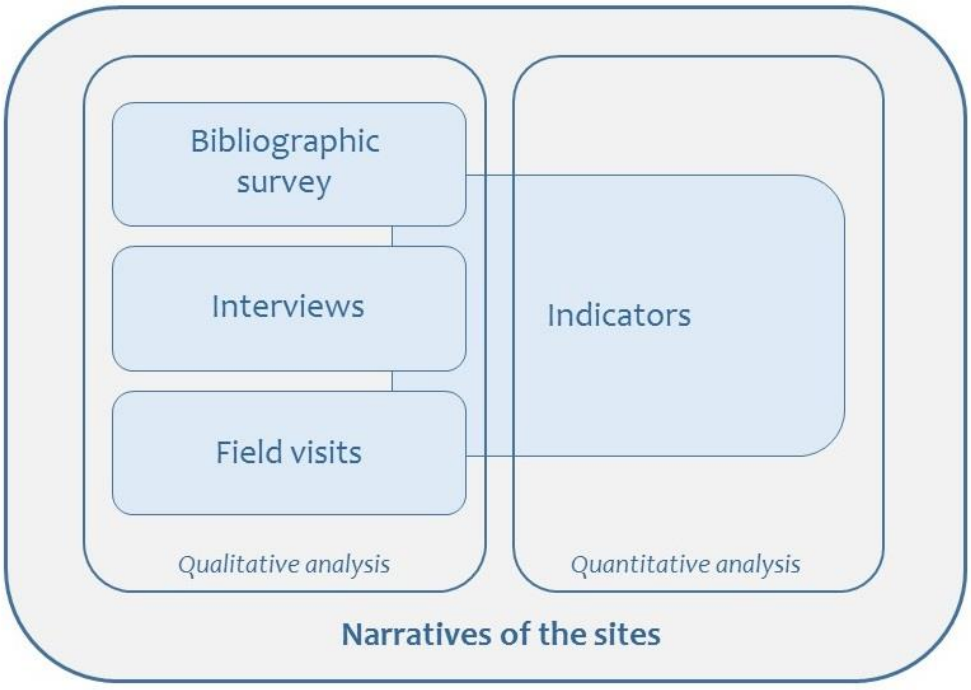


Figure 1.3: Schematic representation of the methodology of the thesis (Source: Own elaboration)

1.5.1 Bibliographic survey

An important part of the work relied on the consultation of written literature. The written sources covered both scientific as non-scientific literature, as explained below. Obviously not all sites will offer the same quantity and diversity of literature. The search which has been, therefore, eclectic by nature (from systematic key word use in google scholar, google news and other portals; to cross references from any written document or oral referral).

Scientific literature

Within the context of this work, the scientific literature gives a theoretical background to the hypotheses tested and to discuss the results within a broader conceptual and experimental framework. Given the multidisciplinarity of the thesis, it also serves as a conceptual basis to the terms and definitions used in the different parts of the text.

From the point of view of the disciplines tackled, the scientific literature covered the following areas of interest: heritage, local development, landscape ecology, tourism management, environmental conservation, wetland management… etc. Occasionally reference texts from specific disciplines (anthropology, law, economy, ecology, conservation…) have been reviewed, when needed.

The first part of the thesis relies mainly on reviews and other theoretical articles, whereas the second part (results, discussion) rather is supported by literature explaining case studies in which the spatial-temporal scale, type of landscape or type of heritage concerned are equivalent in some way or the other to those studied in each of the papers proposed here.

Grey literature: Statistics reports, market studies, project proposals

Given the fact that this thesis aims at the future prospects of the natural and cultural values of saltscapes, most of the literature examined consists of documents expressing the current situation or the future plans and programmes for a given site. This kind of grey literature includes unpublished reports, plans and projects or internal documents and has usually been provided by non-profit organisations and authorities (Ander-Egg 2003). The main sources of information in this thesis were project reports, plans as well as policy and management documents. These sources are cited and included either in the references section or in footnotes.

Besides, many of the case studies close to the geographical areas or to the scope of interest of this thesis have only been presented within the context of conferences and similar events. Conference proceedings have proven to be an essential source of information and potential informants.

Also, a significant number of doctoral and master's theses have been written on the subjects close to the scope of interest of this thesis. Many of them have remained unpublished but retain interest to be considered within this research.

Press clippings on the activities at the case study sites

This thesis is oriented towards the current management of salinas and saltscapes. Although they are not the main source of information, press clippings may provide an insight in the successes and failures; the expectations and the final results of management practices (see also Roigé *et al.* 1999). Analysing the content of press clippings, the understanding of factors that affect management can be improved and lessons for the future learnt.

1.5.2 Interviews with key stakeholders and focus group dynamics

Stakeholder selection

Understanding local development around a saltscape (or any other form of landscape-based heritage) requires an appropriate identification of stakeholders. Stakeholders are not only decision makers, owners or managers of the site, but any person or organization that feels affected by whatever happens to this piece of heritage or landscape. They have been vaguely defined as someone who has "the right and capacity to participate in the process" (Aas *et al.* 2005). Stakeholders may not even be resident in the area, but nevertheless feel a sense of belonging to the site or the landscape concerned. Also, the local community as a whole should be considered a legitimate stakeholder in itself, simply by its proximity, although the boundaries of what is "local" are not always clear (Aas *et al.* 2005). It may even occur that some stakeholders are not even aware of their role as such, since they do not feel immediately implied by the decisions that affect the site or the landscape. These are challenges that should be borne in mind when identifying stakeholders (Aas *et al.* 2005).

A key element in the methodology of the research are the interviews with key stakeholders in relation to past, present and future plans and projects in the study sites involved. Several systems exist to identify stakeholders systematically and engage them in decision making processes (e.g. de Groot *et al.* 2006, Durham *et al.* 2014, Grimble 1998, OECD 2015). In this thesis, stakeholder involvement did not surpass the stage of consultation, as they provided information, but did not take decisions. The identification of stakeholders can be classified by the type of influence they have on the site's management (and *viceversa*) and the nature of the influence (government, management, NGO, informal opinion leaders…). Also important is their spatial distribution, that is, the administrative level at which they operate (from individual, to local, regional, etc.) (de Groot *et al.* 2006).

The main challenge of this part of the research has been finding the right stakeholders in each of the study sites, given the variety of roles and profiles (see for example Steyaert *et al.* 2007). They are organised or not in formal, known structures, or may be informal opinion leaders without apparent filiation. Some of them may have the right information, but not the capacity of willingness to participate in the research (Aas *et al.* 2005). Stakeholders that have been relevant in the recent past but are now disengaged from the site have also been taken into account, especially those who have inspired or triggered management practices that have been used for some time or still are.

Stakeholders are relatively easy to identify on paper, but at the end of the day, the interviews are performed with real persons who may represent a certain organization, but inevitably also give their personal insight. Especially in smaller, rural areas, these persons may have fulfilled different relevant roles in the management of the site or may even represent several

stakeholders simultaneously. The content of the interviews is sometimes biased by this cross-fertilization effect.

Another issue to take into account is the fact that the relations among stakeholders are far more complex that may seem at a first glance and it may therefore be easy to hurt personal feelings when choosing whom to speak first, for instance. Others may feel overpowered by local elites and rather stay silent (Aas *et al.* 2005). This delicate balance in the stakeholder hierarchy should also be taken into account when inviting several stakeholders at a time, i.e. in focus groups.

The final location and timing of the interviews was also determined by both personal convenience and cultural context. Several authors stress the importance of an adequate understanding of the local cultural and political environmental contributes to a better performance (Aas *et al.* 2005). So interviews were performed in offices, in private homes, in bars or in the outdoors, all depending on with whom, where and when.

The number of interviews did not depend on quantitative or statistical criteria, but rather on the availability of stakeholders and the quality of the information they were expected to provide. As Kvale (1994) suggests, "interview so many subjects that you find out what you need to know".

The main stakeholders identified are:

- Salt maker organizations and individuals
- Owners and managers of the sites
- Local and regional authorities (relevant for tourism, local development, heritage and nature conservation…)
- Local (informal) opinion leaders
- Local NGOs and other non-profit organizations with interest in local culture, environment, heritage…
- Local museums and tourism offices
- Scholars, scientists and other specialists
- Salt traders and other gastronomic opinion leaders
- Local businesses associated to salt and salt-related products and services
- Tour operators, tourism sector in general
- Visitors / summer dwellers

Annex 2 offers a list of the stakeholders interviewed in this thesis.

The adequate identification of stakeholders was initiated at a distance but significantly improved on site, during field visits. Informal conversations with members of the local community proved useful to gain insight in the most relevant actors and events of the site.

Individual interviews and group dynamics

The interviews used to gather information have been semi-structured or open-ended, depending on the informant. The reasons to choose this format are threefold (see also Corbetta 2007). Firstly, the situations tackled were very different between and even within sites, due to the diversity of stakeholders interviewed. Secondly, the information needed was rather complex and responses were expected to differ significantly, both in tone as in

content. And, thirdly, the need to create a relaxed atmosphere, especially in group settings or with biased stakeholders (which existed, given the nature of the research and the background of the researcher). The questions have been adapted to the person who was being interviewed. They were rather like a "daily life conversation", especially to the eyes of the informant (Ander-Egg 2003). They were free to choose their own terms and feelings and were not judged –whether positively or negatively– on the content of their response. The interview had several items to be kept in mind, but they did not follow a fixed order. A list of the themes to be tackled during an interview can be seen in Table 1.6.

Table 1.6: List of themes to be tackled during the interviews

To saltmakers	To managers/institutions
1. How did you relationship to these salinas / saltworks start? When did that happen? Why? 2. What is your dearest memory of the salinas / saltworks? Why? 3. What is the hardest part of your work in the salinas / saltworks? 4. How do you see the salinas / saltworks today? Would you change anything? 5. How would you like them to be in the future? 6. What (else) do you think could be done here to preserve or improve the salinas / saltworks? 7. What do you need to achieve this? 8. How would you like to be involved in this process? 9. Do you think that a protection status is beneficial for the salinas / saltworks? Why (not)? 10. In this research we would like to offer the results to other salinas / saltworks. Would you like to offer advice to others? 11. Would you like to add anything?	1. How is your institution involved with the salinas / saltworks? Do you have any formal cooperation? Of what kind? How and when did it start? 2. Who initiated the recovery of the salinas / saltworks? Why? 3. What other stakeholders were involved in the process? 4. What plans and projects have been proposed for these salinas / saltworks? / For the municipality (affecting the salinas)? 5. Which of them have been successful and why? 6. Which of them have failed and why? 7. What are the strengths of the management model of these salinas / saltworks? 8. What challenges and difficulties have been faced in the management and how did you solve them? 9. What threats and challenges do you face now? 10. What do you think should be improved in the management? Or in other aspects? What do you need for that? 11. What take-home lessons have you learnt in the process? What would you change? 12. What are your plans for the future with respect to the salinas / saltworks? What do you need to achieve them? 13. Do you think having a protection status, quality labels and similar recognitions is/would be beneficial? Why (not)? 14. In this research, we would like to offer the results to other salinas / saltworks. Would you like to offer advice to others? 15. Would you like to add anything?

Source: Own elaboration

The idea behind this choice was to create a comfortable atmosphere during the interview, and to allow other issues of interest to arise. Stakeholders were approached directly (if they were previously acquainted) or via common acquaintances. Seldom was the stakeholder approached without prior warning for an interview, except for minor information requests (tourist offices, salt makers met on the spot…). Whenever possible, the interviews have been performed on site, unless the informant preferred to do it elsewhere. If the opportunity arose to visit the site with selected informants, a wealth of additional information was often obtained.

If possible, interviews were recorded and transcribed for future reference. When this could not be done, notes were taken immediately after, but there is a risk of having lost some information. Another limitation was that of language. More difficult have been the interviews performed in French and Danish/Swedish, whereas those in English or Spanish posed no language problems.

An additional constraint that needed to be taken care of was to avoid creating expectations about the future fate of the site or tire informants with questions they very likely have answered a number of times previously (e.g. about salt making techniques, to salt makers).

Occasionally, stakeholders were interviewed following the technique of focus groups. This allowed to exchange ideas in a group format, which enhanced collective critical and creative thinking and reinforced common ideas among individuals. The focus groups technique allows individual ideas to become a group's and gain momentum within the context of management (Lone Kristensen, University of Copenhagen, pers. comm.). To this end, the focus groups chosen tend to be uniform, and gather like-minded persons, so that they feel confident to open and offer their thoughts freely to the group (del Val 2006, García 2006, Gutiérrez 2006).

Qualitative interviews as these have often been qualified as not being objective and trustworthy enough (Kvale 1994). However, this thesis is focused on reconstructing the recent history of the study sites, that is, in understanding the driving forces by which the sites have evolved from salt making areas in socioeconomic decline to sites in the process of patrimonialization. Hence, a systematic qualitative technique would not have contributed to gain an in depth insight in these processes and therefore interviews and group dynamics were chosen, to this end.

Detailed instructions on how to conduct semi-structured and non-structured interviews were obtained from different authors (see for instance Ander-Egg 2003, Corbetta 2007, del Val 2006, García 2006, Roigé *et al.* 1999) plus my own previous experience (e.g. Carrasco & Hueso 2006a, Chicharro *et al.* 2011, Njiforti & Hueso 1998, Sunyer & Hueso 2004,).

1.5.3 Field visits and observations

The field visits were intended to observe first-hand the state of the salt making site and the surrounding landscape, to visit the businesses and other facilities associated to salt and to perform the interviews with local stakeholders.

Observations on site

The main purpose of the field visits was to know the site by first-hand experience. The direct observation allows to better understand the circumstances of the site, the decisions of its owners or managers and the relations among stakeholders. No two sites are alike and a personal visit significantly increases the insight into the features of each one of them. The personal observations contribute to have a holistic view of the management of the site and improve the understanding of both strengths and opportunities as well as the challenges and difficulties that may arise in the implementation of plans or projects involving the saltscape. The field visits also provided an opportunity to register via photographs, video or audio the most relevant features and significant events related to or resulting from the management of the site.

Visits to local businesses associated to salt and salt-related products and services

Salt making sites are not isolated entities in their territory. Their existence affects, in some way or another, the presence of local businesses and entrepreneurs. Local stakeholders have

an important insight in the relevance of the site in the regional socioeconomic development and provide good ideas on the improvement of the management of the site. If their products and services are related to salt and salt by-products, these stakeholders have a deep knowledge of the market drivers, the challenges and the opportunities that the site faces.

Visits to local museums and other tourism facilities

Most salt making sites offer some kind of outreach activities to the public. Local museums and tourist offices can provide a first-hand information on the heritage of the site, the links with other heritage assets, and offer possibilities to deepen into the historical knowledge of the site and its hinterland. With this knowledge, contemporary management processes become easier to understand.

1.5.4 An indicator based-tool to assess local development performance and opportunities of salt heritage

Why an indicator based tool?

Indicators are a powerful tool to provide objective and easy to understand information about a specific site and allow comparison between similar sites. They also allow an early warning of the trends, needs and challenges that lie ahead of the sites assessed (Dale & Beyeler 2001, Field *et al*. 2010). They are often used both in environment and landscape research (Bürgi *et al.* 2004, Dale & Beyeler 2001, Field *et al*. 2010, Heink & Kowarik 2010a, 2010b, Hockings *et al*. 2000, Nogué *et al.* 2009) and in tourism and heritage research (Choi & Sirakaya 2006, Solymosi 2011, Hernández-Morcillo *et al*. 2013, OMT 2005). Some studies have specifically focused on the use of indicators to identify changes in saline wetlands and salinas (Castañeda & Herrero 2008, López *et al.* 2010a).

Many authors have attempted to define "indicator" and several valid definitions exist (for a thorough review, see Heink & Kowarik 2010a). Within the context of this work, I consider an indicator as a piece of information that, together with others and following the instructions of a method, helps measure the state and evolution of activities and processes according to objective criteria. It can be expressed in quantitative or qualitative terms and is the result of the gathering and treatment of certain data following specific and well known instructions.

The main challenge designing a set of indicators is that it should be representative enough of the reality to be tested but, at the same time, easy to elaborate and to interpret. Their main strength and weakness, is, at the same time, their simplicity; grasping the full complexity of the study object will hardly be feasible. If the set is going to be used in different sites or in different moments in time, the sources of data should also be reliable and consistent. Additionally, it should be as universal as possible, in order to allow comparison (AENOR 2003, Dale & Beyeler 2001, Erhard *et al.* 2002, Furley *et al.* 1996, Ministerio de Medio Ambiente 2000, OECD 2003, Ramírez 2002, Sunyer & Manteiga 1998). Given the complexity of the issues concerned, especially in landscape research, an adequate choice of scale (temporal, geographical and political) is also essential (Bürgi *et al.* 2004).

Indicators are usually linked with each other, as they reflect phenomena that may be synergic or antagonistic. If studied as a set, some may be more relevant that other, needing therefore to be appropriately weighted. Also, an indicator should strike a balance between being

robust and at the same time, sensitive to the change it needs to detect. A few authors have offered methodological advice on these issues (Dale & Beyeler 2001, Field *et al.* 2010, Fennesy *et al.* 2004, Heink & Kowarik 2010a, 2010b; Hughes 2002, OECD 2003, Ramírez 2002). Indicators allow the standardization of both data mining and results, as they use similar data sources and units. By using indicators, common criteria are applied to activities, processes and methods, thereby optimising common efforts and allowing the exchange of information. As common sources and methods are used, it is possible to compare different sites with objectivity and anticipate challenges and difficulties, enhancing a common understanding among them. In this way, an indicator tool becomes in fact independent of time and location, providing a universal value to its use.

How does the tool work?

The indicator system described here is based on the sum of the values of a set of simple and easy to obtain indicators, but goes beyond the sum itself by giving an overall picture of the state, trends, needs and challenges faced by the site assessed (Ministerio de Medio Ambiente 2000). The tool is based on a set of so called intrinsic and extrinsic indicators. The first refer to site-specific information and the latter refer to information about the tourist market and the business environment of the hinterland. Examples of intrinsic indicators are size of the site, its state of conservation, devices and tools remaining, protected flora and fauna species on site… etc. On the other hand, examples of extrinsic indicators are the number of visitors to the area, their motivation and seasonality, quantity and quality of tourist facilities in the hinterland, etc. (see Tables 1.7a-e).

The tool consists of 25 indicators (15 intrinsic and 10 extrinsic, see Tables 1.7a-e). Some of them are quantitative, that is, show discrete, measurable amounts (figures, sizes, percentages...) and others are qualitative (yes/no options, existence or not of certain features...). Efforts have been made to eliminate subjectivity in the measurement of the indicators, at the risk of eliminating some features that may have been of interest, such as the emotional attachment of visitors (e.g. Viñals *et al.* 2011a, see also below).

Tables 1.7a-e (summary): List of indicators used in the tool

Indicators	Intrinsic	Extrinsic
General	IG1 Historical relevance IG2 Protection status of the site IG3 State of natural conservation IG4 State of cultural conservation IG05 State conservation of intangible heritage	
Local development	ID1 Site in operation ID2 Development plans ID3 Organisation of salt makers ID04 Participation projects / networks	ED1 Stakeholder diversity ED2 Companies using salt ED3 Visibility of the salt business ED4 Direct employment
Tourism	IT1 Tourism plans IT2 Visitor infrastructures on site IT3 Motivation of visitors IT4 Yearly nr of visitors IT5 Accessibility of the site IT6 Visibility of the site	ET1 Climate/Seasonality of visitors ET2 Tourist attractions nearby ET3 Time of travel tourist markets ET4 Eating facilities close to the site ET5 Site included in package tourism ET6 Aesthetic aspects

Source: Own elaboration, see also Hueso & Carrasco 2012

Each indicator is described in detail in a specific worksheet (see Annex 1), which provides the possible sources of data, desirable frequency of data collection and expected trends, among

others. An overall indicator table gives a numerical value from 0 to 4 for each indicator, according to easy to measure qualitative or quantitative criteria (see Tables 1.7a-e).
These values may simply be added up, so that the total value of a site may range between 0 and 100 (=4 x 25). In order to keep the tool as simple and universal as possible, no indicators have been weighted, assuming they are all independent of each other and equally valuable, while this is not entirely the case.

A critical view on the indicator tool

The indicator system as desgned for the purpose of this research, has certain gaps that needed to be filled by complementary research. Besides from its simplicity, the overall weakness of the indicator tool is related to its quantitative nature. Most of the information for the indicators was obtained during personal visits to the sites and individual interviews with stakeholders. During these interviews, it was clear that certain types of information were not percolating well enough into the indicator system, namely:

- *Personal and political goodwill of stakeholders:* The tool does not detect the real willingness of stakeholders to recover the site, despite what the indicators state (whether in favour or against). The management decisions may or not be steered by planning documents, but at the end of the day, it is up to the institutions to determine whether to carry on or not. Decisions on the recovery or use of the study sites were often biased by other decision-making processes or afected by institutional or political strategic moves that were often unrelated to the salt making activity itself.

- *Hidden relations between stakeholders*: Stakeholders may have personal, professional or political ties that go beyond the scope of the saltscape, but do affect their decisions or preferences towards its recovery. Being in relatively isolated areas, local stakeholders have high visibility within the community and bear the burden of these relations that may have little to do with salt making. Management decisions with respect to the site can be affected by this. In addition, some of the stakeholders may have double or triple functions (e.g. salt maker and council member), making it difficult to combine and adequately defend their interests. To what extent this is happening in a given site cannot be measured with indicators.

- *Socio-cultural bias towards heritage*: Attitudes towards heritage may vary from one site to the other or within one site, in time. In some territories, socio-cultural inertia may pollute decision-making processes or discourage innovation and novel initiatives. Some country people can be highly skeptical about new uses of heritage and consider salt making (as has always been done) a dead end. In certain territories, it is understandable that there is not much faith in the benefits of tourism, let alone in the attractiveness of so-called gourmet salts. These attitudes may influence the power of decision of local authorities and offer little support from civil society.

- *Opportunities for financing*: The opportunities to finance recovery actions may be volatile and depend of factors that cannot not be detected objectively. The global crisis that started to be visible in Spain after 2008 has clearly had an impact on the investments in cultural and environmental recovery projects. Those salt making sites that already had a good headstart before then (e.g. Salinas de Añana, San Juan, Rambla Salada) may have suffered the consequences less starkly than others that were in early stages of financing (e.g. Gerri de la Sal) or are now trying to find the

financial resources (e.g. Peralta de la Sal, Arcos de las Salinas, Espartinas). Regardless of the impact of the crisis, financial opportunities are often serendipitous and depend more on the altertedness of stakeholders or on personal relations to people or institutions with the capacity to invest. Then case of the Association of Friends of Poza de la Sal, for instance, is a good example of a team of activists actively searching for financial resources and finding, year after year, enough subsidies to continue their work, despite the obvious difficulties they (and other sites) face.

- *Supraterritorial decisions or threats*: The indicator system fails to identify any territorial decisions taken beyond the local scope and these are not easy to detect with indicators. Therefore, there are a number of situations that have not been taken into account but could affect the conservation of the site, such as the construction of large infrastructures (e.g. roads, tunnels, wind farms), the production of oil by fracking or the protection of the site by such restrictive measures that not even recovery is feasible. Also, tensions between different authorities' management instruments and laws (agriculture, nature conservation, industry, mining, watershed management…) can be contradictory and may result in the paralization or even regression of recovery efforts.

- *Emotional detachment*: Given the fact that in many sites, the onwership was held by certain families of individuals, the local community has never felt emotionally attached to the site. In some other sites, where a Community of Heirs (see Chapter 5) was in charge, the emotional attachment was much stronger. This feature is hard to express in an indicator, but is considered relevant for the outcome of the score.

Finally, an ontological weakness exists with this particular indicator tool. The tool has been designed, used and interpreted by myself, without a peer review process or a blind check, except for the application of a previous version of the tool on some of the partner sites of the ECOSAL-Atlantis project (Hueso & Carrasco 2012).

In conclusion, this tool does not provide an absolute scale but rather allows to compare sites with each other to detect needs and difficulties of those with lower value results. It also helps to detect strengths and weaknesses within a given site and challenges, risks and trends a given site may face, and therefore may contribute to anticipate future situations, too. This tool may help policy makers and sponsors to decide where to make the most cost-efficient investment efforts and define adequate resource allocation strategies, both within site as among sites, and the timing of these efforts. The tool is best complemented with qualitative research methods, such as the literature research and, especially, the interviews, described above. It is the combination of the three that provides a powerful narrative about each site and allows to compare, draw conclusions and serve as example to others. The latter tried to retrieve this information as well. Hence, in order to understand the patrimonialization process as fully as possible, both qualitative and quantitative information is needed. Often different versions of the same story were obtained, a hopefully balanced and necessarily synthetic version of them is offered in Chapters 5 and 6.

Table 1.7a: Intrinsic indicators – general (IG)

Nr	Indicator	Criteria				
	Value	0	1	2	3	4
IG1	Historical relevance	Unknown relevance	Site not so relevant (located among more relevant sites in the region)	A reference site in the region (size, historical importance)	Only site in the region of this type (location, special construction, habitat…)	Site of national importance (from historical or technical point of view)
IG2	Protection status of the site	None	Natural or cultural at least at regional level	Natural or cultural at national or EU level (i.e. BIC, Natura 2000)	Both cultural and natural at least at national or EU level	Both cultural and natural protection at least at global level (Ramsar, UNESCO…)
IG3	State of natural conservation	Confirmed and regular presence of 0 species of the Habitats and Birds Directives	Ibid. 1 - 10	Ibid. 10 - 25	Ibid. 25 - 50	Ibid. > 50
IG4	State of cultural conservation	No structures visible, original state unknown	Bad (structures useless, original state known)	Regular (most traditional structures need reconstruction) or replaced by modern	Good (most structures need restoration and/or some have been replaced by modern ones)	Excellent (most traditional structures are capable of being used)
IG5	State of conservation of intangible heritage	No (former) salt makers who can tell the story of the site (deceased, moved)	Yes, but initially not interested	Yes, they are retired but willing to tell the story	Yes, it is in operation	Yes, in operation and includes popular traditions and festivities around salt

Source: Own elaboration, see also Hueso & Carrasco 2012

Table 1.7b: Intrinsic indicators – development (ID)

Nr	Indicator	Criteria				
	Value	0	1	2	3	4
ID1	Site in operation	Abandoned >100 yrs ago	No (abandoned < 100 yrs ago)	Yes (only brine or salt for industrial purposes)	Yes (only demonstration purposes)	Yes (artisanal salt)
ID2	Development plans	No plan at all	Several proposals, none actual	Internal plan in operation	Public plan (PDS, PRUG…), no funding	Public plan with guaranteed funding
ID3	Organisation of salt makers	No salters present	Individual / unorganised	Registered freelance / family business	Cooperative, SME	Cooperative, SME with quality seals
ID4	Participation in projects or networks	No	Yes, with other salinas in the region	Yes, with other businesses in the region	Yes, active at national and international level in the past	Yes, currently active at national and international level

Source: Own elaboration, see also Hueso & Carrasco 2012

Table 1.7c: Intrinsic indicators – tourism (IT)

Nr	Indicator	Criteria				
	Value	0	1	2	3	4
IT1	Tourism plans	No plan at all	Several proposals, none actual	Internal plan in operation	Public plan (public use, PDT…), no funding	Public plan with guaranteed funding
IT2	Visitor infrastructures on site	None	Informative signs	Interpretative panels	Museum, visitor centre (restricted opening times)	Museum, visitor centre (open year round)
IT3	Motivation of visitors	None/unknown	Casual, unorganised, spontaneous	Captive audiences (schools, elderly)	Mainly generalist tourists (secondary motivation, stay < 1hr)	Often eco/cultural tourist (choose site actively, informed, may have a specialised interest)
IT4	Yearly nr of visitors in the area (municipality)	None/Unknown	Hundreds	Thousands	>10,000 (mainly regional)	> 10.000 (also relevant nrs of national and foreign visitors)
IT5	Accessibility of the site	No	Limited	Yes (only buildings, not the site)	Yes (only reduced mobility)	Yes (all disabilities)
IT6	Visibility of the site	Not publicised	Secondary references in internet, leaflets...	Specific leaflets on site	Specific website, leaflets at hotels and tourist office, books…	Plus: signposted on roads, references in local businesses, social media, etc.

Source: Own elaboration, see also Hueso & Carrasco 2012

Table 1.7d: Extrinsic indicators – development (ED)

Nr	Indicator	Criteria				
	Value	0	1	2	3	4
ED1	Stakeholder diversity	No stakeholders involved / interested	Known owner / Local authority	Plus: Local NGO or SME	Plus: Supralocal authorities, other organisations (but not coordinated)	Coordinating entity representing stakeholders
ED2	Companies using salt	None	Owner sells salt, brine to non-local companies	Owner sells salt and simple salt by-products also locally, no other businesses	Few businesses, basic or no transformation of the product (guided visits, gourmet salts)	Salt as a base for multi-sectorial local activity (food, cosmetics, tourism, wellness, R&D, events…)
ED3	Visibility of the salt business	Not publicised	Secondary references in internet, leaflets...	Signs on site	Specific websites, leaflets at hotels and tourist office…	Plus: references in specialised media, presence in shops at national, international level, etc.
ED4	Direct employment	None employed	Seasonal work, only saltmaking	Seasonal work, also tourism	Year round, only salt making and/or tourism	Year round, multi-sectorial

Source: Own elaboration, see also Hueso & Carrasco 2012

Table 1.7e: Extrinsic indicators – tourism (ET)

Nr	Indicator	Criteria				
	Value	**0**	**1**	**2**	**3**	**4**
ET1	Climate/Seasonality of visitors	None/unknown	Yes (season < 3 months)	Yes (season up to 6 months)	Yes (also open on school holidays and weekends)	No (regular visitor flow year round)
ET2	Presence of tourist attractions nearby	No	Yes (only leisure)	Yes (scattered leisure and monuments)	Yes (clustered leisure and monuments, no services)	Yes, with full services
ET3	Time of travel from main tourist markets (e.g. capital of the region)	> 90 min	60 – 90 min	45 – 60 min or < 30 other attractions	30 - 45 min or < 15 other attractions	< 30 min
ET4	Eating facilities close to the site	No	Yes (5-15 min driving time)	Yes, but need a vehicle	Yes, within 10 min walking time	Yes, on site
ET5	Site included in package tourism	No	Irregular groups	Captive groups	Local packages	National & international upmarket
ET6	Aesthetic aspects	Generally unattractive (pollution, waste noise, roads, industry...)	Less attractive (careless maintenance, pollution or waste visible)	Neutral (some disturbing elements in the landscape)	Attractive in general (site attractive, background neutral)	Very attractive (natural site, nearby village with traditional buildings…)

Source: Own elaboration, see also Hueso & Carrasco 2012

1.5.5 Narratives of case studies

The results from the combined qualitative and quantitative methods applied to the cases have been gathered in the form of narratives. These narratives should tell the story of each site's patrimonialization process; how they changed from salt making sites in decline to more or less thriving heritage sites. The story should not only tell how they achieved their success but acknowledge failures, and, most important, the lessons learnt. The story of the recent history of these sites has been gathered and told in a similar way to "life histories", without judging the facts, events or roles played by the stakeholders involved (Ander-Egg 2003, del Val 2006, Roigé *et al.* 1999). It is, after all, a gathering of multiple, partial and polyphonic "life histories" of those stakeholders engaged with the site during a period of their lives and what happened to the site as a result. Even though the story is told from the standpoint of the narrator, together, they should reflect the most recent "biography" of the site from a collective point of view (Connely & Clandinin 1990).

The stories told here should offer a diversity of points of view, show the conflicts and its solutions in detail and unfold them in their full complexity. It should be noted that these sites are alive and their history is changing as we speak. Their narratives should therefore be kept open, but they should also contribute to anticipate new situations, there or elsewhere. As Flyvbjerg (2006) indicates, "good narratives typically approach the complexities and contradictions of real life". The cases presented here should be rich in both and hopefully well-seasoned, too. With salt, of course.

1.6 Structure of the thesis – A guide to the reader

The thesis is divided in three parts. The first part (Chapters 1-4), including this introduction, offers a framework of reference to the issues tackled: concepts, definitions and terms, according to different scholars. But, also, the state of the art of the main theme, saltscapes and salt heritage, with special emphasis on the current situation in Europe. A legal and policy framework on the protection and management of saltscapes is offered here. The second part of the thesis (Chapters 5 and 6) provides the narratives of the twelve study sites; one chapter devoted to the nine sites in Spain and the other, to the narratives of the three remaining sites in Europe. The third part (Chapter 7 and 8) delves on the analysis and conclusions from the second part. The sustainable development around salinas is analysed through the products and services that are compatible with their conservation. The socioenvironmental constraints of the sustainable development of saltscapes are analysed, before moving on to the conclusions of the thesis. As an addition, a management model on the sustainable use of saltscapes and their heritage values is proposed. The following section offers a summary of each of the chapters of the thesis.

Chapter 2. Heritage and cultural landscapes within the context of local development

Prior to entering the subject of saltscapes and salt heritage, this chapter is devoted to gain insight into the main concepts that will be used throughout the thesis. Despite the catalogue-like sections found here, the emphasis of this chapter is on the deep and complex relation these concepts (heritage, landscape, territory, development, sustainability) have. These are discussed from a multidisciplinary point of view, although necessarily in a very concise fashion. The extensive number of cited references provides abundant material for further reading. Definitions of heritage, heritage ownership and the related process of

patrimonialization are offered. Classical subtypes of heritage and landscapes are presented, such as natural, cultural and intangible; but new forms are also mentioned, such as industrial, mining or food-related heritage. Linked to this, landscapes, their cultural dimension as well as their multifunctional, ecosystem-service aspects are discussed. Special emphasis is made on wetlands as paradigmatic cultural landscapes, which are key ecosystems in the case of salinas. The role of education and interpretation of heritage and landscapes as awareness raising tools is looked upon, especially in relation to the local communities in place. The chapter then moves on the role of heritage and landscapes in local development, with special emphasis on rural tourism, including some ideas on the tensions between heritage and tourism and how these actually support each other; other rural productive activities and the economic value of these aspects. Finally, a word is said about sustainable development and how it relates to the concepts tackled here. All these concepts will be discussed from a western, European perspective and are ordered from small, close scale (heritage) to mesoscale (landscape) and larger scale (local development). Although this chapter does not intend to offer a comprehensive review of all these ideas, it constitutes a conceptual frame of reference for the rest of the thesis.

Chapter 3. Heritage and landscape values of saltscapes

After the theoretical analysis of the concept of heritage (in the precedent chapter), the aim of this chapter is to understand the influence of the salt making activity in shaping cultural landscapes, to acknowledge the diversity, ubiquity and abundance of salt heritage values, and a to discuss why these should be protected. Background information on salt as a commodity is provided, including the need of salt for human survival and the properties of this substance as a chemical compound. A significant part of the chapter is devoted to the understanding of salt making as an activity, with a description of the different modes of salt production according to geophysical (location, landscape, hydrogeological origin) and productive criteria (production method, scale, state of the facilities, source of energy, access to the hinterland). Attention is devoted to the dychotomies that have traditionally been stressed between industrial and artisanal salt making, the Atlantic and Mediterranean methods of production and the mining and agricultural character of the activity. Although most current salt making techniques will be briefly explained, the focus will be on traditional solar evaporation and a few words are said abound inland solar salt making, too, as almost all case studies of this thesis are these types of sites. Albeit superficially, this chapter will contribute to understand the relevant role of the production, distribution and trade of salt has meant to culture and heritage in different periods of History, as well as; the intangible heritage associated to traditions, cultural manifestations and the organisation of the work around salt making. It also provides an overview of the biological features and values that can be found in salt making sites and their relevance in the production activity. Finally, the causes and consequences of the abandonment of salt making for both heritage as for landscapes are discussed, and the reasons for the recovery of saltscapes and salt heritage are offered.

Chapter 4. The preservation and management of salt heritage and saltscapes

This chapter constitutes the transition between the state-of-the-art in the current situation of saltscapes and salt heritage in Europe and the specific situation of the study sites. Two main aspects are presented here: The protection and the management of salt-related values. To start with, the function and values of saltscapes and salt heritage are addressed. Given

their vulnerability, as explained in previous chapters, the most common threats and challenges faced when trying to preserve their natural and cultural values are presented. To understand them, a framework of ecosystem services and values provided by saline wetlands is offered. As a consequence, the need to protect saltscapes and salt heritage and how this has been achieved so far by different protection and conservation measures is tackled. A distinction is made between legal protection instruments, agreements and networks found at international, European and national –for Spain– level, as well as indirect protection measures. The latter can be of different nature, such as voluntary agreements including land stewardship strategies or the inclusion in thematic networks and cultural/tourist routes. Also, different labels and certificates for salt as a product, whether voluntary or with external certification, are discussed (IGP/DPO, food labels, quality certificates, nature or environmental protection certificates, etc.). Another key aspect of the protection of salt-related heritage is management. The stakeholders involved in the management of salt heritage and saltscapes are identified and commented, and their role in this task is analysed, with some comments on participation processes in the management of saltscapes and in the study sites. The role of planning instruments in this management will be analysed, with special attention on natural protected area planning and master plans. Finally, different public and private funding instruments for the recovery and sound use of salt heritage and saltscapes are briefly commented. Special emphasis is given to European – funded transnational projects, in which some of the study sites have participated.

Chapter 5. Results of the case studies in Spain

In this chapter, the first true results are offered. The nine inland salinas in Spain that are protected as a monument are studied here from the point of view of their patrimonialization processes. A general introduction is provided on the geological, climatic and technological background of inland salinas in Spain. The reasons for choosing salinas protected as BIC, as compared to other protection instruments, are also indicated. Before proceeding to the narratives of each case study, the nine sites are presented jointly from the starting point of the process of declaration as BIC and includes current ownership and management practices, as well as societal issues such as local demographics. The indicator scores obtained are shown, both in overview as in detail, plus the general features of all nine patrimonialization processes. The latter includes a timeline of events for the sites, allowing a fast comparison among them. The bulk of the chapter is the construction of the narratives of the patrimonialization processes in each of the nine sites, based on the interviews, the field visits and the bibliographic survey performed. Hence the narratives are a reconstruction of the events that eventually have led to the transformation of the sites from a situation abandonment to a heritage-based activity, with different degrees of success. In each case, the starting point is the privatization of the salt making activity as established by law in 1869. After that follows the description of how they declined as productive facilities and how they have been seen and considered for protection as a monument, and how far the protection, recovery and sound use of the sites, have got. In addition, a summary of the current socioeconomic situation of the sites as well as the good practices, are being dealt with. The chapter ends with an overview of the good practices found in all sites, plus the challenges that lie ahead of them, as a whole.

Chapter 6. Results of the case studies in Europe

In this chapter, second part of the true results section of the thesis, the different study cases in Europe are presented. The text starts with a justification of the choice of the three study sites, which have undergone a satisfactory patrimonialization process and can now be considered consolidated. A joint description of the sites follows, allowing the comparison between them and with the Spanish study sites. The scores of the indicator tool are also shown, intended this time also as a comparison with the Spanish study sites. The bulk of the chapter, however, is the presentation of the three selected sites. Each one starts with a geographical description and a brief review of the salt making history in the area. The salt making technique itself is not described, but references are provided for those interested. Especially important in each case is the analysis of the patrimonialization process, starting from the moment of decline, the (re-) discovery of the salt making heritage in the area and how it has gradually been transformed into a heritage value. Attention is given to the role of the different stakeholders involved and to the current management issues. Also, the role of tourism, nature and health and wellness, as pillars of sustainable development, are discussed. The narratives of patrimonialization are fed by a combination of literature, interviews and field visits. The description of the sites ends with a list of good practices in heritage management, and the threats and challenges in the use of this heritage are discussed. If possible, pitfalls and mistakes in this process are briefly analysed, too. Each case study has a short conclusions section that summarizes the main outcomes of the analysis. The chapter then ends with a brief reflection on the role of European funded projects and the international projection of the three sites.

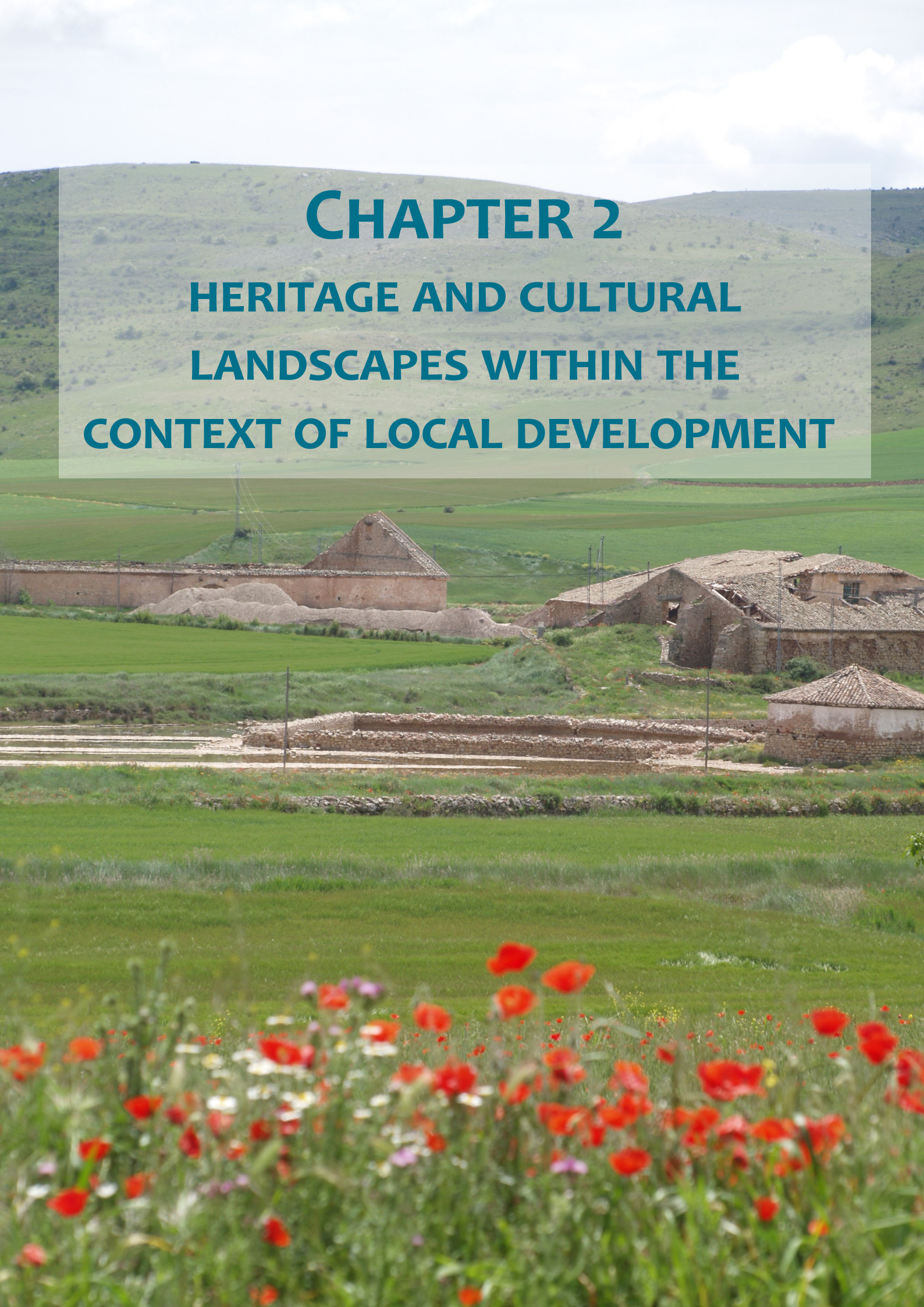
Chapter 7. The sound use of salt heritage and saltscapes

This chapter introduces the concept of "the trilogy of salt", that is, the combination of uses a saltscape can typically offer as a means to ensure sustainable development in and around a (former) salt making site. Although a salt making site is originally designed to produce salt, many other products and services can be offered, that are compatible and supportive of the salt making activity itself. These are classified in three large groups: Food and gastronomy, eco-cultural tourism and health and wellness. Food includes not only the salt itself, which can be presented in different formats and in combination with herbs, spices, etc., but also other food items, such as pickles, cured meats, glasswort, etc. A classification of salt according to different criteria is offered, focusing on what makes a salt sustainable. Derived from salt, non-food items can also be offered, such as mother lay or salt blocks. Ecocultural tourism provides an additional source of income by means of guides visits, salt museums and other activities in combination with the assets offered elsewhere in the territory. Salt-related events strengthen the effect of ecocultural tourism and may attract new visitors. Salt has always been a source of health and, today, saltscapes may offer a range of products (brine, mother lay, muds) and services (baths, inhalation, halotherapy) that contribute to one's wellbeing and health. All these activities are framed by the natural and cultural context each saltscape has to offer. Importance is given to the conservation, social and educational activities that take place in them, but, perhaps most relevant is the aesthetic and symbolic perception of saltscapes and salt heritage that exists in our culture as a result of a millennial-long relationship to this substance. The final pages of the chapter are devoted to reviewing manifestations around salt in art, music and literature.

Chapter 8: Towards a sustainable management of saltscapes and salt heritage

This chapter uses the results offered in Chapters 5 and 6 and the discussion provided in Chapter 7 to analyse the patrimonialization process of the saltscapes and salt heritage studied. To understand the process, a review of the general, environmental, economic and socio-cultural challenges affecting saltscapes and salt heritage is offered, together with a brief SWOT analysis of these sites. Among the latter, special emphasis is given to the issue of ownership of salt making site, given its relevance in the success or failure in patrimonialization processes. The situation of the different study sites with respect to their heritage situation is analysed (sites before patrimonialization; with patrimonialization in progress or with a consolidated patrimonialization process) and includes the pending challenges all the sites have, even the consolidated ones. A mention to other cases of patrimonialization is offered, too. As a result of this analysis, a model of sustainable management of saltscapes and salt heritage is proposed, based on the results of the good practices identified in the case studies. The model identifies five stages in the process of management, to be taken in order, as well as diverse factors that should act as guidelines along the process. This model is intended as a methodological tool not only for saltscapes, but for other types of cultural landscapes, wetlands and rural heritage, which may benefit from the experience of others. An important section of this chapter is devoted to presenting the conclusions of the thesis, which are divided per research question and hypothesis, as they have been presented in Chapter 1. Finally, the last pages provide ideas for further research, stemming from the conclusions of this work. Some broaden the thematic scope (e.g. saline lakes, salt mines), others enlarge the geographic scope and yet others suggest comparative studies with similar heritage manifestations, such as cultural landscapes or industrial heritage.

This chapter has offered the motivation, objectives, research questions and hypothesis of this thesis. The choice of study sites has been justified and the methodology explained. In this last section, a summary of each of the chapters has been offered, to provide the reader a guideline to understand the structure of the work and the train of thought that follows throughout the text.



Chapter 2

Heritage and cultural landscapes within the context of local development

Table of Contents Chapter 2

2.1 Introduction

Prior to entering the subject of saltscapes and salt heritage, this chapter is devoted to gain insight into the main concepts that will be used throughout the thesis. Despite the catalogue-like sections found here, the emphasis of this chapter is on the deep and complex relation these concepts (heritage, landscape, territory, development, sustainability) have. These are discussed from a multidisciplinary point of view, although necessarily in a very concise fashion. The extensive number of cited references provides abundant material for further reading. Definitions of heritage, heritage ownership and the related process of patrimonialization are offered. Classical subtypes of heritage and landscapes are presented, such as natural, cultural and intangible; but new forms are also mentioned, such as industrial, mining or food-related heritage. Linked to this, landscapes, their cultural dimension as well as their multifunctional, ecosystem-service aspects are discussed. Special emphasis is made on wetlands as paradigmatic cultural landscapes, which are key ecosystems in the case of salinas. The role of education and interpretation of heritage and landscapes as awareness raising tools is looked upon, especially in relation to the local communities in place. The chapter then moves on the role of heritage and landscapes in local development, with special emphasis on rural tourism, including some ideas on the tensions between heritage and tourism and how these actually support each other; other rural productive activities and the economic value of these aspects. Finally, a word is said about sustainable development and how it relates to the concepts tackled here. All these concepts will be discussed from a western, European perspective and are ordered from small, close scale (heritage) to mesoscale (landscape) and larger scale (local development). Although this chapter does not intend to offer a comprehensive review of all these ideas, it constitutes a conceptual frame of reference for the rest of the thesis.

2.2 Heritage and patrimonialization

This thesis deals with the cultural and natural values of salt heritage and saltscapes and their contribution to the sound local development of their area of influence. While there seems to be a common understanding of these terms, it appears appropriate to offer a conceptual framework of the keywords that will arise now and again during the present text (cultural heritage, cultural landscape, natural heritage, local development…). This chapter is devoted to offering some thoughts on these terms, whereas further chapters will deepen into the state of the art of salt heritage, saltscapes and their role for local development and education, as well as methodological issues and expected outcomes.

2.2.1 What is heritage

There are many definitions of heritage, according to the historical, cultural and academic background of the proponents. This chapter provides a brief reflection on the discussions around the uses of heritage that have arisen from these different definitions. Heritage is a symbolic representation of identity (Marcos 2004, Prats 1997, Ruiz & Hernández 2007, Smith 2006) that goes beyond physical items (e.g. a monument) or the material support for an item or an activity (i.e. a "site") (Greffe 2003, Smith 2006). As Smith (2006) says, "rather, heritage is what goes on at these sites, and while this does not mean that a sense of physical place is not important for these activities or plays some role in them, the physical place or 'site' is not

the full story of what heritage may be". The material or tangible heritage provides a physical representation of those things from "the past". Identity, thus, provides communities with an idea of continuity in time and space, a sense of belonging, a sense of self. It offers a reference to the past and a course to follow among the changes that the group may experience with time (Pujadas 1993, Prats 1997, Roigé & Frigolé 2010, Smith 2006).

The concept of heritage is thus a social construction. As Roigé and Frigolé (2010) state, a heritage object or element "epitomizes affections and feelings". It is an invention that does need a certain degree of consensus, but is not necessarily accepted by all at a global scale and can even cause divergence and disagreements. A certain symbol, a certain asset can be considered heritage or not, depending on what, when, where… and who authorizes it. In western culture, the words "heritage" and "property" are semantically close and bear a significance of possesion. The Spanish term *patrimonio* or the French, *patrimoine*, actually mean both. In English, whereas "property" stresses the fact of possession, heritage is focused on the process of inheritance (Nuryanti 1996, Vecco 2010), indicating dynamism in its character. As with any kind of legacy or inheritance, heritage is used while being passed on, and therefore it evolves and even its interpretation changes with time. Heritage and how we see it adapts to social changes and is resilient to them.

2.2.2 The process of patrimonialization

Who decides what is heritage

Patrimonialization[8] is the process by which certain elements are used and transformed into heritage, usually by means of authorization. Heritage assets and manifestations may be old, ancient even, but "the process of patrimonialization is a reinterpretation of the past based on contemporary issues, via the reshaping, reconstruction, elaboration, construction or restoration of buildings, landscapes, monuments, performances, forms of associating and values" (Roigé and Frigolé 2010). This definition stresses the idea of needing a time gap between the creation of an heritage element and its recognition as such, as if it should be ripened before use.

Prats (1997) states that "heritage is a selection made by society", that it is society who authorizes it. Following this line of thought, Greffe (1999) writes that "far from being received, the biggest part of heritage is chosen". It is society who reaches a consesus on the identity value given to the symbols that finally constitute that particular society's heritage. The value, meaning and uses of heritage are given with specific values, goals and interests in mind (Prats 1997, Roigé & Frigolé 2010). The patrimonialization process is far from ideal: it usually responds to a combination of three related courses of action: the idealization of heritage, driven by cultural change, in a quest for pristine and authentic values; the commodification of its potential uses, market-driven and with the consideration of capital; and the institutionalisation, steered by political willingness or convenience (Espeitx 2008, Vaccaro & Beltran 2010).

Heritage repertoires can be activated by certain stakeholder groups or cultural mediators and their efficiency can be measured by the extent of the adhesions to their proposal and

[8] *Patrimonialization* is a neologism stemming from French and Spanish-speaking authors' writings on heritage, not so commonly used in English. It may be considered similar to *heritagization*, although the term "patrimonialization" includes a sense of ownership that is deemed relevant in this context.

the support of the public administrations and the power elites. This activation is subject to the tensions arising from different uses -and, therefore, needs- heritage can have: political, economica, scientific, social… Often, heritage has to be authorised by certain institutions which bear the necessary prestige and apparent objectivity and neutrality in their goals and interests. Examples of these institutions at global level are UNESCO or ICOMOS and their equivalent at national or regional level are the public authorities or well respected NGOs. The authorized heritage discourse focuses attention on aesthetically pleasing material objects, sites, places and/or landscapes that current generations are willing to care for, protect and pass on to future generations in order to forge a sense of common identity based on the past… or simply satisfy present aesthetic, cognitive or artistic needs at individual level (Greffe 2003, Smith 2006). This view mirrors an elitist discourse in which only heritage professionals and scholars can authorise heritage, leaving local communities and other stakholders aside. This issue will be tackled later.

Although the emergence of the concept of heritage seems quite recent, often linked to the development of nineteenth-century nationalism and liberal modernity, the use of the past to construct ideas of individual and group identities is part of the human condition (Harvey 2001). In the end, the concept of heritage is "intrinsically embedded with a sense of the pastoral care of the material past" (Smith 2006). But in order to take care of the inheritance of the past, a feeling of ownership, or, at the least, stewardship, should exist. The question, then, is: who owns heritage?

Who onws heritage

The ownership of heritage, whether natural, cultural or otherwise, is a contested issue. The exclusivity of private possession, common in Western thinking, translates in the need of vast amounts of public and private money for the ownership and maintenance of heritage by specialised institutions (Harding 1999). Despite this, the framework suggested by the term "ownership" does not cover the "spectrum of connections between people and things (or between people through things)" that arises when considering heritage (Brown 2004). To start with, because of its character of inheritability, heritage assets do not only belong to the current legal owners of the physical elements (item, building, land…), who may be recognised as such in the official documents, but also to its future legal owners. Given also its role in the buiding of an identity at community level, the local community can feel a certain, albeit symbolic degree of ownership towards heritage. Following the logic of environmental economics and ethics (Taylor 1986), heritage in general can also be considered to be owned by those who live in it, who experience it or those who simply know it exists. In other words, by those who acknowledge the intrinsic, non-instrumental value of heritage. Heritage, thus, becomes a common good with a complex array of *owners* which become stewards with different degrees of commitment and goals with its care. The paradox lies in the fact that only the legal owners are entitled to take decisions on the fate of their propoerty (with some exceptions marked by law, as shall be seen in Chapter 4). Once the property becomes a common good and the reponsability is shared by society as a whole, individuals tend to withdraw from decision making processes, resulting in an overal lack of care.

One of the most powerful forces on the fate of heritage are their users. As said, heritage satisfies a number of individual and collective needs (Greffe 2004). Today, heritage, above all, is a consumer product (Prats 1997), in which its elements have been moved from their original purpose, to their consumption in the service sector. Heritage can in fact be considered the precurssor of tourism, used as such already in the Antiquity, when the

wealthier traveled to see works of art (Choay 2007). New heritage-based consumer items arise from a fast transformation process or are even created *ad hoc* (i.e. recently abandoned industrial facilities and recovered within a few years or designer museums that are built more for the sake of the building than its content).

With the rights given by the posession of heritage, and the enjoyment of its real or perceived ownership via cognitive, aesthetic or leisure activities, come the obligations. The conservation and valorization of heritage is a straightforward obligation and they will be discussed in detail within the context of salt heritage within this thesis. The issue of authenticity and its paradoxes has already been tackled. Below, the sustainability of heritage (management) will be addressed, as a tool to pass this legacy to future generations in its integrity.

2.2.3 Types of heritage

As discussed above, heritage can be "constructed" and "activated". In fact, almost everything is "capable of being turned into heritage" (Roigé & Frigolé 2010). Today, many forms and types of heritage exist, some of which overlap in their origin, their use or their value. In this section, a few types of heritage "with surname" that are relevant in the context of this thesis will be discussed. Obviously, many categories are being left behind (cultural heritage related to art, architecture, archaeological remains, historical events, religion, spiritualism); discussing them goes beyond the scope of this work.

Cultural heritage

Culture is a very difficult term to define, given its degree of abstractness (Kroeber & Kluckhohn 1952). To start with, it will depend on the historical and cultural tradition it is reflected upon. Culture is the result of historical experience, the live expression of a human group that transforms it, re-elaborates it and offers it to its descendants. Anthopologists define it as the "coherent totality of everything that is learned by group behaviour" (Byrne 2008). It can also be understood as the feature that offers singularity and personality to a human group, i.e. "everything that makes one society distinct from another" (Byrne 2008). Culture is the element that separates human beings from nature, yet it teaches us our attitudes to nature; it is the mediation between man and nature (Claval 1999, Panikkar 2004). Therefore, culture translates into a physical expression on the territory and the landscape, on nature itself, which in turn serves as a support for the cultural assets of a community (Iranzo 2009). UNESCO, as a global organization, may offer the broadest interpretation of this concept. UNESCO (1982) defines culture as a "the set of distinctive spiritual, material, intellectual, and emotional features of society or a social group. In addition to art and literature, it encompasses lifestyles, basic human rights, value systems, traditions, and beliefs".

So, what about heritage? If everything that is learnt and transmitted socially is culture, not all of it is necessarily heritage. Heritage assets are a selection of cultural goods, as values give some things significance over others and thereby transform some objects and places into "heritage" (Avrami *et al*. 2000). García Canclini (1999) adds a quality of solidarity to cultural heritage, as it is shared by a group of people with a joint sense of identity and provides a setting for "social complicity". Hence, heritage is a set of the most significant and relevant cultural elements and expressions (Marcos 2004). Heritage can thus be understood as the

set of objects employed by human communities to adapt to their environment, to facilitate social relationships and to create symbols with meaning (Ballart 1997). Other authors offer different descriptions of heritage, considering it as a historical selection, as a legacy, as a sediment of culture and creator of social identity, a role model or even an opportunity to make business, all depending of the stakeholders involved in its definition (Fontal 2003, García Canclini 1999). Heritage, as a common cultural legacy, contributes to establish links between past and present generations (Rodríguez 1997), contributing to the inclusion of the most enriching cultural elements within the latter and strengthening the sense of belonging of the communities (Iranzo 2009).

Cultural assets form part of the identity of a human community and are their relevant form of expression of their culture. If heritage is considered a selection of culture and tradition, then it can be transformed into a collective notion of identity, of shared memory (Harrison 2010, Hernández & Ruiz 2005, Llull 2005, Marcos 2004). Heritage, according to Bourdieu (1999), is therefore a symbolic capital linked to the notion of identity. Then, heritage should not be protected with aesthetic criteria or simply because of its age, but because of what it means and represents, to maintain (and shape) the values embodied by the heritage. This is a relative issue, sensitive to the different historical assessments of stakeholders, to the changes in society and their perception of identity and even subject to temporary fashion. The valuation of heritage can respond to different criteria and motivations, even within a same community and within the same period of time. The different criteria (economic, political, cultural, spiritual, aesthetic…) have "correspondingly varied ideals, ethics, and epistemologies" (Avrami *et al*. 2000). It is therefore necessary to examine *why* and *how* heritage is valued, and by whom. As Avrami (*et al.* 2000) state:

> "The creation of cultural heritage is largely derived from the way people remember, organize, think about, and wish to use the past and how material culture provides a medium through which to do this. The stories invested in objects, buildings, and landscapes, by individuals or groups, constitute a currency in which the valorising of cultural heritage is transacted".

Also, the products of material culture have different meanings and uses for different individuals and communities (Avrami *et al*. 2000), today and in the past, and so they will in the future. To start with, the idea of heritage has evolved from being considered a portion of private property that gave enjoyment to its individual legitimate owner to a growing model of dissemination of acknowledged cultural heritage assets as models and symbols of a collective identity (Prats 1997). Heritage has thus been transformed in a "common good and a common interest" (Avrami *et al*. 2000).

Already the Charter of Athens (1931), The Hague Convention (1954) and the Charter of Venice (1964) introduced the terms "heritage" and "cultural property", and gradually the public became aware of the need to preserve them. The UNESCO, which can be considered the most relevant international organization devoted to its characterization and protection, in its *Convention concerning the Protection of the World Cultural and Natural Heritage given in Paris in 1972* defines "cultural heritage" as monuments, groups of buildings and sites, the latter being of "outstanding universal value" (UNESCO 1972). In this definition, UNESCO clearly opts for an instrumental description of heritage, in which only the material, physical items are considered, with a certain degree of rigidity and oblivious to the dynamic and emotional character of heritage, as discussed above. Alas, the term "outstanding universal value", which should stand as a warrant of neutrality, is not further defined. In this sense, the Burra Charter (ICOMOS 1982) proposes "the conservation of the cultural *significance* of a site, due to its aesthetic, historic, scientific or social value" (Vecco 2010; highlight is mine).

While international laws and conventions agree to declare a clean environment as a universal right, the legal right to "cultural heritage" is under discussion. The legal protection of cultural heritage and identity has been better specified when related to indigenous communities (Blake 2000). Among others, the African Charter on Human and Peoples' Rights (also known as the Banjul Charter), an international human rights instrument that is intended to promote and protect human rights and basic freedoms in the African continent, does acknowledge it. Its article 22 states "All peoples shall have the right to their economic, social and cultural development with due regard to their freedom and identity and in the equal enjoyment of the common heritage of mankind".

On the other hand, cultural identity is, of course, a much broader concept than cultural assets or even the classical idea of cultural heritage, as it refers to a quality rather than an artefact (Blake 2000). It is unclear how this universal right to freedom and identity translates into the protection of specific cultural values associated to certain practices, such as salt making, or traditions, such as those related to salt.

With these ideas in mind, it seems redundant to speak about "cultural heritage", as heritage implies a cultural origin. Nevertheless, in the past decades, the term "natural heritage" (see below) has gained momentum, as opposed to cultural legacy, but with similar implications to human identity and responsibility towards its stewardship. Therefore, it is common to use nowadays the term "cultural heritage".

Intangible heritage

So far, the discussion on "cultural heritage" above has focused on their tangible elements. However, cultural heritage also includes other manifestations and elements that can be considered to belong to the realm of intangible heritage. Although this specific type of heritage is obviously an important part of "cultural heritage", it has received specific attention in recent years and will therefore be discussed separately. Several documents (the Palermo Charter in 1990, the Tlaxala Declaration in 1982, the Paris Recommendation in 1989 or the Oaxaca Declaration in 1993; all cited in Vecco 2010) deal with cultural identity. Some years later, the UNESCO's Convention for the Safeguarding of the Intangible Cultural Heritage given in Paris in 2003 (UNESCO 2003) defines "intangible cultural heritage" as:

> "the practices, representations, expressions, knowledge, skills – as well as the instruments, objects, artefacts and cultural spaces associated therewith – that communities, groups and, in some cases, individuals recognize as part of their cultural heritage".

The definition provided by UNESCO has managed to gather the scholarly discussions and definitions of ethnological heritage, folklore, etc. that have been in use for a long time and has therefore become an international standard as of today. This intangible cultural heritage, transmitted from generation to generation, is constantly recreated by communities and groups in response to their environment, their interaction with nature and their history, and provides them with a sense of identity and continuity, thus promoting respect for cultural diversity and human creativity. The "intangible cultural heritage", as defined above, is manifested in the following domains: (a) oral traditions and expressions, including language as a vehicle of the intangible cultural heritage; (b) performing arts; (c) social practices, rituals and festive events; (d) knowledge and practices concerning nature and the universe; (e) traditional craftsmanship. Some authors consider these domains strictly ethnological and

lacking the more spiritual or intangible links of humans with nature, with values such as beauty, harmony, serenity, silence…, which should in their view also be considered (Mallarach *et al.* 2012). Table 2.1 offers a rather clear classification of intangible heritage elements.

Table 2.1: Types and subtypes of intangible heritage (with asterisk, those likely to be found in traditional salt making sites)

Group	Subgoup
Artistic	Traditional dances and ritual games* Traditional music and songs* Nature photography* Nature writing* Landscape and nature painting* TV programmes and films*
Aesthetic, perceptual or scenic	Sensorial beauty (visual, auditive, olfactory)* Silence and quietness* Harmony*
Social, historic, ethnographic	Traditional know how* Feasts, fairs and events* Food and gastronomy* Relevant historical facts or events*
Governance	Governance and traditional institutions* Traditional rules and regulations*
Oral and linguistic	Traditional tales and legends* Sayings and riddles* Languages and dialects Toponyms and their etymology* Vernacular nature vocabulary*
Religious	Active worship sites* Rituals and ceremonies* Pilgrimages*
Spriritual	Natural elements considered sacred Abandoned worship places Other natural, magic or sacred sites

Source: Adapted from Mallarach *et al.* 2012, based on the UNESCO categories of intangible heritage (UNESCO 2003)

Having said this, Smith (2006, 2014) goes beyond this binary division between tangible and intangible heritage. After all, if the process of defining heritage depends on the values assigned to it by a certain community, all heritage should be considered intangible (Roigé 2014). Several authors claim that heritage can be better understood as a verb rather than a noun (Harvey 2001). As said before, the definition of heritage is a dynamic one, as it represents the interaction with identity and memory (Smith 2014). This is probably more evident in modest, non-monumental heritage assets, which have not yet reached a universal and stable consensus on their value as such, e.g. salt-related heritage.

Figure 2.1: Gradient from tangible to intangible heritage in a salina

Values	Symbolic	Economic/productive
Tangible	e.g. a brine well with a legend telling how it was discovered	e.g. the salt production basins
Intangible	e.g. religious and symbolic uses of salt (universal)	e.g. agreements on the distribution of brine

Source: Based on an example offered by Mallarach (*et al.* 2012)

In fact, many heritage elements have tangible and intangible values in them, each to a certain degree. That the separation is not always obvious can be illustrated with an example. In Figure 2.1, the gradient between "tangibility" and "intangibility" is illustrated with typical saltscape heritage assets; the darker the background colour, the more intagible a manifestation of heritage is. Cultural landscapes such as these host both productive and symbolic values, some of which are physically represented on site (tangible heritage) and others aren't (intangible heritage).

Natural heritage

The idea of a "pristine wilderness" and the nature/culture divide originated by the Enlightenment philosophy, led to the concept of a natural landscape that needed to be preserved from human activity. The Romantic Movement also found expression in the conservation of natural heritage and promoted its contemplation, resulting in the creation of the first national parks in the US and Europe and the first Scandinavian ecomuseums (Casado 2010, Santamarina *et al.* 2014, Smith 2006, Vaccaro & Beltran 2010). An interest in local folklore, traditional uses of natural resources and the immaterial aspects of cultural heritage in general, closely related with each other in rural environments, followed suit. At this point in time, the patrimonialization of nature has followed a similar logic than that of cultural heritage, by way of the idealization, commodification and institutionalization of its values. In this process, nature became something valuable, pure, authentic and public; thus it became a common good (Vaccaro & Beltran 2010).

Again, the UNESCO offers a reference with respect to the consideration of natural heritage. The *Convention concerning the Protection of the World Cultural and Natural Heritage given in Paris in 1972* defines "natural heritage" as natural features, geological formations and natural sites, all of which should be of "outstanding universal value" (UNESCO 1972). Again, UNESCO fails to explain these terms. It also remains to be specified what are the aesthetic criteria to consider natural beauty, given the differences in sensitivity to this criterion between cultures.

Within the context of saltscapes, it is essential to consider the term geological heritage, which is defined as "those geological elements that stand out for their scientific, cultural or educational value" (Carcavilla *et al.* 2008a). In the end, geology offers the understanding of the physical yet dynamic substrate onto which natural and cultural heritage rest and how local communities interact with it. Although some authors wish to further subdivide this type of heritage in smaller categories (paleontological, hydrogeological, mineralogical… heritage), most definitions coincide with the previous one. On the other hand, the current trend is to consider nature (thus its substrate) with a holistic, integrated perspective (Carcavilla *et al.* 2007).

Contrary to what happens with cultural heritage, natural values are usually protected by law with different denominations but relatively similar protection measures at global scale. The International Union for Nature Conservation (IUCN), defines "natural protected area"[9] as "a mainstay of biodiversity conservation, while also contributing to people's livelihoods, particularly at the local level". Protected areas represent the efforts towards conserving nature and the services it provides and most of them accept the presence of traditional uses of natural resources, as long as they are compatible with the conservation of the natural values of the site.

[9] URL: https://www.iucn.org/about/work/programmes/gpap_home/pas_gpap/ [Retrieved May 2015]

Industrial and mining heritage

Within the context of productive activities such as salt making, it is necessary to understand the concepts of industrial and mining heritage, which can also be considered a subtype of cultural heritage. This one of the so called "new heritages" (Patin 2012) and constitute a very broad category. The *Nizhny Tagil Charter for the Industrial Heritage* signed in 2003 defines industrial heritage as:

> "the remains of industrial culture which are of historical, technological, social, architectural or scientific value. These remains consist of buildings and machinery, workshops, mills and factories, mines and sites for processing and refining, warehouses and stores, places where energy is generated, transmitted and used, transport and all its infrastructure, as well as places used for social activities related to industry such as housing, religious worship or education".

Mining heritage can be considered a subdivision of this category, related to the "extraction and primary transformation of minerals and rocks" (Puche 2007). A specific challenge of mining sites is their geographical isolation as compared to other industrial sites, located closer to urban areas. This may in turn be positive, as the mining site can more easily be integrated with the natural heritage that surrounds it and offers interesting opportunities for innovative cultural uses, such as land art (Biel-Ibáñez 2009).

The Nizhny Tagil Charter Little somehow fails to acknowledge the social relations and culture arising from the industrial activity, very relevant in this context: Mining and industrial heritage sites are places where people have worked and lived, and done so in very specific circumstances. The rough conditions of the work itself, the remoteness of certain mining areas, the overcrowding of living quarters and the usually poor living standards in these communities have created certain social practices and an identity of their own. This culture hails values such as solidarity and generosity, but is also a reminder of collective suffering. Transforming this history into heritage does not necessarily go smoothly. Similar challengers, albeit at a larger scale, are found among those who wish to recover the heritage of places of suffering, also known as "dark" or "difficult" heritage (e.g. the Berlin Wall, the Auschwitz death camp or Alcatraz, to name a few) (Biran *et al*. 2011, Logan & Reeves 2008, Strange & Kempa 2003).Therefore, this type of heritage can be better defined as "the life and works of industrial civilisation", in the broadest sense posisble (i.e. from prehistoric mining to contemporary music, Alfrey *et al*. 2003). The industrial heritage is the evidence of activities which have had and continue to have profound historical consequences.

A risk specific to industrial heritage is that abandoned sites or spaces can be considered "junkspace" (Koolhaas 2002) or "nonplaces" (Augé 2008)[10]. They are seen as unaesthetic, neglected, even dangerous. They are detached to the land, to the traditions and are perceived as places of suffering by some. The "de-industrialisation" of a landscape leaves a void after the site has ceased to be productive, but the ecological footprint of the activity has not yet been erased. Therefore, industrial heritage in particular needs the provision of new

[10] Within this context, the words "place", "space" and "site" may share semantic fields but have quite different connotations. While a site is a location where a heritage or other kind of item (i.e. natural or cultural monument, building, remains…) is situated, a space is simply a given area with limited spatial dimensions. Place, on the other hand, can be considered a space with meaning to an individual or a group (Tilley 2006, Tuan 1975). To illustrate this idea, the phrase "sense of space" would refer to the capacity to orientate in three dimensions, whereas a "sense of place" alludes to the emotional attachment someone has with respect to a location.

meanings and identities to be activated. As said before, industrial heritage has had a short transition time beween its original use and its activation as heritage, and often has ocurred within the same generation (Casanelles & Fernández 1994, Pardo 2010,Tempel 2012). The biggest challenge is to acknowledge the narratives of those people who have created the heritage element and involve them in activating it. In contemporary post-industrial societies, this heritage can be reused within the context of a services-oriented economy, with culture and tourism among its main drivers, far form the personal experience of its original users (Benito & Alonso 2012, Cossons 2012).

However, although industrial heritage is meant to "celebrate the lower classes' everyday material culture, a heritage of the people rather than for the people", the heritage agenda is led by the power elites (Benito & Alonso 2012). Due to this cultural gap, local engagement is difficult to attain, except in heavily industrialised areas. Recently abandoned salinas have the extraordinary opportunity to hold on to this engament simply by recovering the activity they were made for: salt making.

Food heritage

Food is a very powerful means to feel and communicate identity. Eating is a very intimate and yet social activity, it involves the use of most of our senses (touch, smell, taste, sight and hearing) and reaches the depths of our unconscious mind. Food and eating habits also symbolise virtues and sins, give a frame of reference on one's position in the community and are used as a vehicle for social interaction (Bessière 1998, Bourdieu 1999). Sharing food allows people to "remember experiences, explain memories and express a sense of identity" (Bowen & de Master 2011). In addition, the possibility to produce one's own food or at least being able to witness or participate in the process, gives a sense of belonging, of meaning and increases self-esteem (Bowen & de Master 2011).

Food is thus intimately related to other forms of heritage discussed above (cultural, natural, intangible…). Its power stems from the intimate relationship we all have with food and it is therefore a powerful tool for the development of tourism and the social dynamization of rural areas, as shall be seen (Bessière 1998). Food in itself does not constitute a powerful form of heritage if it is not supported by the natural environment where it is grown or produced (natural heritage), the practices and sites of production (cultural heritage) and the know-how of the producers (intangible heritage). Here is why food heritage cannot be understood without the concept of *terroir*, an elusive term indicating the uniqueness of the combination between the biophysical features of the place of production and the knowledge of the producer (Barham 2003, Espeitx 2008, Skuras *et al.* 2006). Originally associated to wine growing, the idea of *terroir* can in fact be applied to any kind of food, even to salt.

But just as with other kinds of heritage, there is a risk of fossilizing practices and processes. As has been discussed above, heritage is a dynamic concept that needs permanent validation, authorisation. The institutionalization of food heritage results in a stiff presentation of items without the emotional engagement actual food usually has, and the production process becomes a "museum of production" (Bowen & de Master 2011). This, also, is a real risk for artisanal salt making sites.

From heritage to landscape and territory

The process of patrimonialization does not only transform physical items or sites or intangible manifestations into heritage (see above), but also links them with each other and with the underlying territory. This is where heritage merges into landscape, where objective manifestations and spaces become subjective, value-laden heritage-based landscapes (Calderón Calderón & García Cuesta 2016). From the use of certain built or intangible assets, heritage has become a more organic item, both from the point of view of scale, abundance and dynamism. This "proliferation" of heritage responds to a higher sensitivity of society, a shift towards a service-based economy and greater permeability of the institutions to admit new forms and scales of heritage (Beltran *et al.* 2008, di Méo 2007). Similarly, the identification and protection of natural areas has evolved to a more integrated landscape perspective, in which cultural -both tangible and intangible- manifestations are also included (Santamarina *et al.* 2014). However, when heritage -whether natural, cultural or a combination of both- upgrades its scale to a landscape level, there is a risk of diluting the authenticity of specific sites, items or manifestations in favour of a larger, territorial picture; to become a reinvented version of itself, in control of other, possibly foreign, users (Beltran 2012, Frigolé 2010, Vaccaro & Beltran 2008).

2.3 Cultural landscapes and ecosystems

2.3.1 Landscapes as cultural concepts

Landscape ecologists define landscapes as a combination of biotic and abiotic features, with human communities as one of the factors shaping them (Zonneveld 1994). Geographers, on the other hand, stress the role of humans in their creation and characterize them in categories according to the relevance and the results of this influence (Santos y Ganges 2009, Zoido 2012). Further down this line of thinking, (landscape) architects focus on the aesthetic aspects and consider them as areas to be managed and trimmed, rather following gardening principles (Roger 2000). In these approaches, the degree of human influence and the results of it, as seen from outside, constitute the main criterion. It should also be borne in mind that landscapes are not only a yuxtaposition of visible elements, but a complex system in which the visible and invisible elements interact, in other words, they "are the expression of the dynamic interaction between the natural and cultural forces in the environment" (Antrop 2005). Looking at natural landscapes, Professor González Bernáldez (1981) defined the parts that can be seen as the "phenosystem", vs those parts that cannot be seen but are the key to understand the landscape, as the cryptosystem. The dynamics of landscapes are in fact usually driven by the "cryptosystem", which explain why a landscape looks the way it does.

In the past, landscapes were considered static and changes were considered a threat. Today, it is widely accepted that landscapes are the reflection of the changing needs of society and, therefore, they evolve, showing us "complex land use mosaics and multi-layered historical sandwiches" (Vos & Meekes 1999; see also Olwig 2007, Taylor 2012). There is, therefore, a time element in them. But the reality is even more complex than that. Ultimately, a landscape is not only defined by its elements and the relationships that arise between them, but by how humans look upon them. Landscapes are "holistic, relativistic and dynamic". Holistic, because we consider them as a whole, as the sum of all of its elements; relativistic, because it relies on our subjective perception and dynamic, because this perception may change in space and time (Antrop 1997, 2000). As Antrop (1997) states, "the perceptive process is

expressed by a different analysis, which results in the recognition of different elements and structures which are considered significant" Therefore, the vision of a landscape will change according to the person, influenced as it will be by both his/her personal and collective cultural background and history, and regardless of the fact that different people may refer to the same portion of territory (Antrop 2005). Landscapes are thus pieces of land that are subject to interpretation and places of symbolic importance, bearers of identity (Smith 2006, Taylor 2012). Their management becomes a difficult task, precisely because of the diversity of visions and approaches, and because of their dynamic nature (Antrop 2000). Perhaps for this reason, some authors prefer to speak of territories, a term less laden with subjectivity, especially when referring to land use planning and management of resources (François *et al.* 2006, Mata 2008, Nogué 2011, Ortega 1998). As seen above, the term "landscape" implies the existence of a human factor, influenced by the way of looking at it. Analogous to Roigé's (2014) vision on all heritage being intangible, similarly all landscapes can be considered a human construction, making the term "cultural landscape" somehow redundant. Nevertheless, there seems to be a consensus in the scientific community on using the full term and hence it will be used.

Three instruments have been designed at European level to regulate landscape conservation, including the Pan-European Biological and Landscape Diversity Strategy, the Action Plan for European Landscapes (ECNC 1997), and the European Landscape Convention (Council of Europe 2000). These policies have recognized the key role of human perceptions and attitudes as the drivers of landscape change and preservation of sustainable landscapes (García Llorente *et al*. 2012). The European Landscape Convention defines landscape as "an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors". A "cultural landscape" can be understood, then, as a complex spatial reality in which natural and cultural, tangible and intangible values interact, resulting in an ecological, geographical and historical construction (Santos y Ganges 2009). UNESCO's World Heritage Convention (1972) defines cultural landscapes as the "combined works of nature and of man". The European Landscape Convention –also known as the Florence Convention–, promotes the protection, management and planning of European landscapes and organises European co-operation on landscape issues (Council of Europe 2000). The preamble of the Convention states that "the landscape contributes to the formation of local cultures and that it is a basic component of the European natural and cultural heritage, contributing to human well-being and consolidation of the European identity" (Santos y Ganges 2009).

The definition of cultural landscapes has been more precisely formulated by Antrop (2005) as "the result of consecutive reorganization of the land in order to adapt its use and spatial structure better to the changing societal demands". Within this context, it should be important to distinguish between traditional and cultural landscapes. The first can be defined as "those landscapes having a distinct and recognisable structure which reflects clear relations between the composing elements and having a significance for natural, cultural or aesthetical values" (Antrop 1997). Traditional landscapes have a long history, which has allowed a slow development, taking a long time to consolidate with few changes and forming a characteristic structure that reflects a "harmonious integration of abiotic, biotic and cultural elements" (Antrop 1997). Traditional landscapes have the power to tell a story, to be witnesses of the past, thanks to their slow dynamics, and serve as a symbol of identity in the local community's collective memory. This is clearly shown in the toponymy, in how these landscapes are named (e.g. "saltscapes", or the more vernacular terms "salinas", "salt marshes", etc.). Hence, traditional landscapes go beyond cultural landscapes because they incorporate the time element and how this time affects their morphology. Again, this stresses their dynamic character.

2.3.2 Multifunctional landscapes

Given the definitions provided above, it can be difficult to distinguish between cultural or traditional or plain landscapes, given the fact that they all acknowledge the human action, whether in its shaping or in its definition. To further complicate things, some other authors refer to these settings as "socioeconomic systems (SES)[11]" (Matthews & Selman 2006) or even as the "total human ecosystem" (Naveh 2000). Socioeconomic systems are cultural landscapes in which not only the past time element is included, but also their capacity to adapt to future changes, namely their resilience and stability. Resilience "refers to the ability to deal with disturbances or changes without altering the essential characteristics of a system" (Plieninger & Bieling 2012). This view stems from the paradox that cultural landscapes are "valued by society in its inherited form, yet this form typically derives from obsolete practices that are no longer viable", risking their fossilization and eventually, abandonment (Matthews & Selman 2006, see also Piorr 2003). According to these authors, landscape policies should focus in the enhancement of multiple landscape functions for current and future socioeconomic activities. The SES approach to cultural landscapes identifies a number of key elements: The natural capital (nl. biodiversity and natural resources), the cultural capital (nl. built infrastructures, cultures and traditions), the social capital (nl. networks, institutions and social learning) and economic capital (nl. employment and wealth opportunities, business confidence) (Selman & Knight 2006). Figure 2.2 shows the relations between these key elements. The capital functions of SES go well beyond the features traditionally considered in cultural landscape research literature and almost coincide with the spheres of sustainability that will be discussed below. While cultural landscapes as described above are characterized by discrete elements that may change in time, the conceptual framework of SES is based on the relations between these elements.

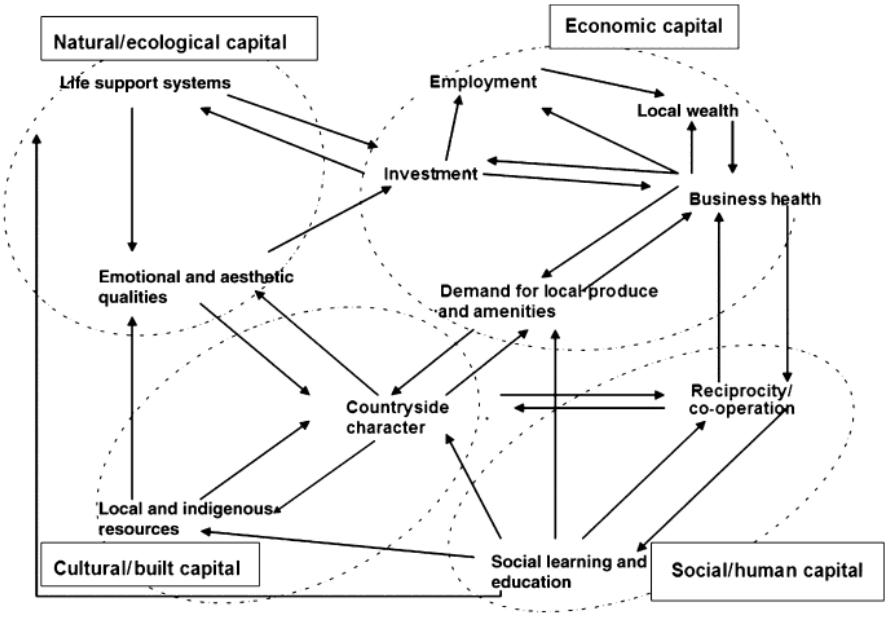


Figure 2.2: Causal links within a cultural landscape
(Source: Matthews & Selman 2006)

[11] The Universidad Autónoma de Madrid hosts the Laboratory of Socioecosystems and the Stockholm Resilience Institute also embraces this terminology

Other scholars prefer referring to these as post-modern or multifunctional landscapes. As explained by Mander (*et al.* 2007), "cultural landscapes are multifunctional through their simultaneous support of habitat, productivity, regulatory, social and economic functions". This can be understood as a mosaic of separate areas devoted to different activities and uses (farming, hunting, leisure, nature preservation, water provision, climate regulation…) but more often, the idea of multifunctionality refers to the synergic functional effects of integrated landscape elements. This means that, well planned, a landscape can serve different purposes, whether simultaneously (e.g. leisure, conservation) or consecutively (e.g. leisure, hunting) (O'Farrell & Anderson 2010, Temorshuizen & Opdam 2009, Vos & Meekes 1999). With this idea in mind, multifunctional landscapes constitute the basis of sustainable landscape development (see further on this, below).

Another, yet more complex school of thought, is the "total human ecosystem" approach, which sees landscapes as "concrete, three-dimensional Gestalt systems forming the spatial and functional matrix for all organisms" (Naveh 1995, 2000). This approach includes not only the physical features, but also the mental, i.e. perceptual and cognitive possibilities a landscape gives. A similar overarching theory was proposed by James Lovelock (1979), who considered the Earth as one single self-regulating organism, Gaia[12]. These theories go beyond the scope of this work and will not be discussed further.

2.3.3 Wetlands as cultural ecosystems

The textbook definition of ecosystems does not usually consider the role of humans in its shaping. For example, Schülze (*et al*. 2005) elegantly explains ecosystem as "the network of interactions among organisms, and between organisms and their environment", though probably assuming that these organisms are wild. However, one cannot expect that these interactions are devoid of the human presence or influence in most cases.

Taking cultural landscapes as a specialised kind of ecosystems, or rather a mosaic of them, the human role is a very relevant one in creating a balance between natural values and the cultural heritage its hosts. The interactions in this case become more complex, as humans have the power to push them towards the limits or put them off balance with relative ease. However, the long-term productivity of cultural landscapes is at its optimum when kept in a balanced situation. Examples of these are olive groves, vineyards, rice fields or salinas, some with uninterrupted activity during millenia.

Wetlands are a particular kind of ecosystem, which are even more complex than terrestrial ecosystems. Wetlands combine several differential habitats (submerged, transitional, emerged, ephemeral, seasonal…) which depend in varying degrees on the availiability of water and whose communities interact with each other permanently. Traditionally, humans have been closely linked to wetlands, making use of their services and resources (including water, see also Chapter 4) and assigning to them values which have also been spiritual in nature (Papayannis & Pritchard 2011).

[12] Rachel Carson (1962) was the first author referring to the Earth as one interrelated system, albeit not from a landscape perspective

In the case of solar evaporation salinas, this specific type of wetland typically hosts sequential ponds with different salinities, each one of them with a specific trophic community that is capable of interacting with the adjacent communities. The ecosystem of a salina needs a very subtle balance within and between its elements and epitomizes a cultural ecosystem. More details on the biological aspects of saltscapes are offered in Chapter 3.

2.4 Local development around heritage and landscapes

Local development policies in European rural areas have focused on three strategies, namely to equal the living standards of urban and rural areas, to favour the creation and diversification of productive activities, focusing on the services and industrial sectors and to halt depopulation and degradation of rural areas (Cànoves *et al*. 2006). In the first case, one of the priorities, at least in Spain, was to improve road communications. At some point, this strategy has backfired, because it has allowed residents to move away from hamlets and villages to bigger towns and tend their fields or rural businesses from some distance. The elderly had the opportunity to move with younger family members or in residences located in these towns. In a vicious circle effect, the rural areas are further depopulating and public services (schools, health centres) are concentrating in these towns (Pereira *et al.* 2004). Despite public and even private efforts to attract young families to settle in rural areas, they have not proven sufficiently effective to go beyond the anecdote, except where the economic activity thrived. The promotion of productive activities has had mixed effects. In some cases, healthy agri-food businesses or even industries have been created. Many of those focused on organic farming, protection of origin and quality production are now exporting their products. Other areas, also elsewhere in rural Europe, have understood their production not only in terms of commodities, but in the offer of "public goods such as beautiful landscapes and natural values" (van der Ploeg *et al*. 2000, see also Armesto & Gómez 2006). Thus, tourism and other service activities have given a thrust to rural economies in certain, very specific areas (Cànoves *et al*. 2006). On the other hand, the Spanish countryside has been witness of many deserted industrial areas that had been built with the original purpose of promoting industrial activity in rural areas (pers. obs.).

At the risk of oversimplifying the complex reality of rural areas (e.g. Pereira *et al.* 2004, OCDE 2006), one could say that there are now two "rural Europes" as a result of official EU-driven rural development policies. One of them includes the areas that have benefitted from EU rural policies and funds and are now thriving; and the other, those areas that have not been able to halt its sociodemographic decline and has difficulties to hold healthy socioeconomic activities within their territories, as these have gone beyond the tipping point[13]. These are usually found in marginal areas of the continent, especially in inland Spain, and some are technically considered "demographic deserts" (Izquierdo 2002). Many inland salinas and saltscapes of the Iberian Peninsula are located in these areas. The combined abandonment of the salt making activity and the depopulation of these areas is a serious threat to the local identity. Not only the heritage may be lost, but also the identity it represents.

In the following section, I will focus on the activities that could serve these areas and contribute to the sustainable use of saltscapes, namely education, tourism and productive activities.

[13] Tipping point, a concept often used in social and ecological research, would be defined as the stage at which a system reaches a point of no return after a gradual shift towards degradation.

2.4.1 Education and interpretation as awareness raising tools

In order to practice a sound use of heritage values, these need to be acknowledged and understood first. Heritage, given its symbolic character, does not exist without a previous comprehension. To this end, tools such as CEPA (communication, education, public awareness) are very useful. The multi-sectorial nature of heritage -whether natural or cultural- has led to the development of complex and often fragmented management plans and programs, with a complex array of stakeholders involved (public administrations, NGOs, local communities, business and industry, scientists, etc.). CEPA is the means to set up the conditions for collaboration so that policies, incentives and regulations across sectors encourage an integrated conservation and sustainable use of heritage. CEPA are crucial instruments to help people to work together and innovate; to spread information, knowledge, values and goals; to build trust, share agreements and avoid conflict. CEPA supports the development of capacity of stakeholders so that they can take responsibility for heritage (Hesselink *et al.* 2007).

Public awareness and communication are general tools than can be designed and provided away from the issue of interest. They often target the general public, without having a direct, personal contact with them or very limited so. Public awareness is usually based on facts and figures, that can be more or less attractively presented to the public. Communication relies on general tools and techniques that are common in other fields too (such as marketing) and may appeal to the emotions or the beliefs of the public. In other cases, depending on the target and the degree of detail, it may also simply stick to facts.

Another pillar of CEPA is education, which stems from environmental education schemes. Environmental education is normally applied in non-formal educational programmes and settings and cuts across traditional curricula, regardless of the level involved. The educational activity can take place on site or off site, or can even be triggered by reading an essay[14]. The aim of environmental education is not to provide information, but to motivate an attitudinal change towards the environment. Environmental education seeks to provoke critical thinking and raise awareness on social and environmental injustices, it does not see the environment as a technical or scientific issue, but rather as a question of policy and politics. This type of education has a humanistic background, taking a clear ethical position, and its recipients cannot remain neutral (Benayas 1999, Caride & Meira 2001).

Analogous to environmental education is cultural heritage education, which intends to provide knowledge about culture and heritage to the public. Whereas the first has been in use for a long time, the second is still considered an emerging tool. The transfer of knowledge on cultural issues is stepping away from the classical museographic design towards a more emotions-based communication strategy. As an example, it is easy to observe how classical musea are adapting their exhibits to the standards found in interpretation and visitor centres in natural protected areas (Fontal 2003, 2016; Pastor 2004). In this respect, both environmnetal and heritage education are gradually evolving from a facts-based activity to a focus on the emotions, thus merging into what is known as *heritage interpretation*.

[14] The Romantic writers did a share of the job with their literary works on nature (see writings by William Woodsworth, Wolfgang Goethe, Gustavo Adolfo Bécquer, Victor Hugo) but most influential were the texts of American essayists Henry David Thoreau, Aldo Leopold, Ralph Waldo Emerson or John Muir, written in the 19th or early 20th century (Hueso 2015d).

The American National Association of Interpretation defines interpretation as "a mission-based communication process that forges emotional and intellectual connections between the interests of the audience and the meanings inherent in the resource"[15]. Heritage interpretation is thus a translation of the meaning embeded in heritage into terms and feelings that are understandable by its recipient. Freeman Tilden has authored the so-called "six principles of interpretation", the fourth of which may be the most clarifying: "The main goal of interpretation is not instructing, but provoking" (Tilden 1957). Reviewed and enriched a few decades later, another principle of interpretation reads, quite simply, "passion", referring to the interpreter's feelings for the heritage resource, which should be transmitted to the visitor (Beck & Cable 2002). Hence, whereas enviromental education is focused on judgement, interpretation touches upon the emotion. It seeks to create a sense of belonging and identity between the heritage resource and the visitor (Ham 2013). The rationale of this technique is that emotions tend to leave a stronger message behind than mere pieces of information (McIntosh & Prentice 1999, Moscardo 1996, Poria *et al*. 2003).

The different awareness and educational tools are summarised in Figure 2.3. Each method goes a step further than the other into the personal knowledge, beliefs and experience of the receiver. To the left, the main public target of each method is indicated.

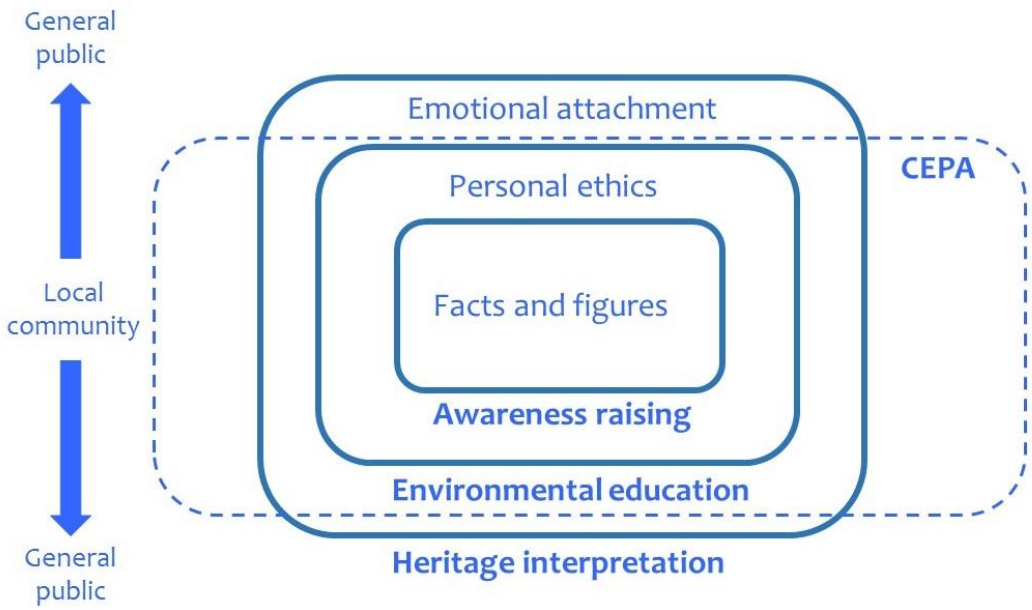


Figure 2.3: Different heritage information tools based on the main channel of transmission (Source: Own elaboration)

In general terms, CEPA is oriented mainly towards the local community in its broader sense and tries to raise awareness of the heritage they are related to. Interpretation, on the other hand, is mainly focusing at visitors and tourists who will have an ephemeral, casual contact with this heritage. However, the awareness raising tools discussed above are experienceing a boomerang effect: Local communities are taking charge of the dissemination and education of the public around their own heritage[16]. The involvement of stakeholders in the

[15] URL: http://www.interpnet.com/ [Retrieved 17 May 2015]

[16] The Council of Europe celebrates each year since 1985 the European Heritage Days, an open call for civil society and local authorities to organise free activities around heritage. It is a very broad concept,

management of heritage and natural protected sites is commonplace worldwide (Aas *et al.* 2005, Hodges & Watson 2000, Selman 2004), especially in sites where heritage values are less known or appreciated or the resources to do so are limited. One of the most relevant roles local communities have in this context is the creation and dissemination of the narratives around their heritage and landscape. Examples of these activities are guiding visitors, letting their events open for visitors or showing their (former) workplaces (e.g. Cole 2004). This enables local communities to feel empowered against possible or perceived threats from outsiders (Beltran *et al.* 2008).

2.4.2 Tourism and heritage, a difficult but necessary marriage

The role of tourism in the protection and promotion of heritage

It is a well known fact that tourism and heritage do not always get along well, nor from the point of view of their management, nor at "street" level. But yet they are mutually interdependent. How to solve this paradox? How can tourism contribute to the conservation of heritage and to the livelihoods of residents?

If we define tourism "traveling to and staying in places outside their usual environment [...] for leisure, business and other purposes"[17], the choice of our destination for leisure activities will most likely include heritage assets that have influenced our decision. Hence, this section will focus on this thematic area (heritage) and the location of the heritage items of this thesis (mainly rural).

Tensions between cultural heritage and tourism

Heritage, as said before, can be "activated", also for the purpose of tourism (Prats 1997) and heritage tourism, in turn, can contribute to create identities, not only among tourists but also within the local community. This is no trivial issue: in places where the the identity of a community was linked to a certain economic activity (industry, mining, agriculture...) which has subsequently disappeared, there is a threat of "dissolution of the society" (unemployment, emigration, ageing…) and the local community's identity may need to be reactivated. Heritage tourism is one of the possible tools to do so (Ruiz & Hernández 2007). However, in this process, there is a risk of losing the community's essence, its authentic self.

The management of heritage changes once tourism comes into the picture. A number of practical issues arise that require careful thinking. Tourism authorities do not always have the local community in mind while designing access to heritage elements and it is easy to fall into the temptation of regulating cultural manifestations without the necessary care. Therefore, authorities should be aware of possible pitfalls (see Table 2.2).

Failure to handle these pitfalls leads to a discussion on authenticity. A term often used and highly valued in heritage management and tourism, it was already questioned by Mark Twain in his book "Innocents abroad", written in 1869. It is still under permanent debate among

a virtually anything fits in (conferences, visits, volunteer action, events…) (Ana Schöbel, Instituto de Patrimonio Cultural Español, Spain, pers. comm.).

[17] URL: http://media.unwto.org/en/content/understanding-tourism-basic-glossary [Retrieved May 2015]

scholars (see for instance Germann & Schnell 2014, Jamal & Hill 2004, Lacy & Douglass 2002, Sims 2009, Taylor 2001…) and no consensus seems to exist. Authenticity can somewhat simplistically be defined as the "quality of being real or genuine" and, from a philosophical point of view, shares semantic fields with other terms such as veracity, meaning, purpose or truth. In the end, it's all about being honest to oneself and to one's environment (owners, managers, policy makers, end-users, other stakeholders). A heritage manifestation only feels genuine when properly authorised (Bessière 1998). In the Nara Document of 1994 the idea of authenticity goes beyond the physical consistency of the item and is applied to the concept of heritage in its broadest sense (Vecco 2010). An important concept within this discussion, is that of *genius loci* or "spirit of place". This is the single most important factor in perceiving a place as authentic or worth a visit. Originally used in architecture, the term related to the identity of a place or a landscape and "emphasizes" its uniqueness (Antrop 2005). It is powerfully evocative expression, but elusive from the conceptual point of view. It remains a personal perception, the spirit of place, but as will be seen below, most of us are capable to identify its absence.

Table 2.2: Pitfalls of heritage tourism

Pitfall	Example
Misappropriation	Misuse of know how
External stakeholders	Profits do not reach the local community
Violation of property laws	Use of public land for private profit
Commodification	Sale of popular art and artifacts
Lack of singularity	Manifestation is not representative of local culture
Aestheticism	Focus on the visual aspects of the manifestation
Fossilization	Not letting a tradition or manifestation evolve naturally
Museification	Remove spontaneity and self governance on manifestations
Teatralization	Transform manifestation into a show
Misplacement	Change the location or date of a manifestation for the convenience of third parties

Source: Own elaboration from Mª Pía Timón, Instituto de Patrimonio Cultural Español (pers. comm.).

There is a rising concern on the degree to which heritage may move away from the authority of science, and spill into its banalization, given the popularity of historical reconstructions and on-site dramatizations (Harrison 2010, Smith 2006) or even the risk of *disneyfication (*Greffe 2003), all of which directly affect the *genius loci*. On the other hand, if heritage is dynamic and evolves with social change driven by the local community and other stakeholders, the question is how authoritative and elitist should science get. Another paradox is that tourists wish to experience –rather than just witness– "authenticity" (McIntosh & Prentice 1999, Prentice 2001, Urry 1990). By doing so, they influence heritage with their sheer presence, and transform it into a "sanitized, false and inauthentic" experience, which has become part of the "heritage industry" (Hewison 1987, in Smith 2006). Bearing into account the strong relationship between heritage and identity, and that heritage evolves in time, there is no use to be tempted by "heritage integrism" (Prats 1997), rather an academic exercise.

From the above, it can be concluded that tourism and culture are seen as mutually dependent. Tourism in heritage sites is an activity that carries controversy among conservationists, because they see it as a threat to the values they defend, but also as a source of necessary income to preserve them (Garrod & Fyall 2000, Greffe 2003, Nuryanti 1996). This tension needs special attention, when taking into consideration sustainability (see below) (Garrod & Fyall 2000). While autheticity has been discussed, it is also relevant to see to what extent the profits of heritage tourism actually benefit the local community and the resources they depend on (Aas *et al.* 2005). Profits may end far from the local community if

the businesses are radicated elsewhere or are reinvested away from the area. Also, the competition with tourism activity may render some other economic activities unprofitable, causing their abandonment (Greffe 1999). This is especially blatant in small communities in isolated, rural areas. In the end, certain areas become the monoculture of rural tourism or even a specific activity in a rural environment (Cánoves *et al.* 2006.), see also below.

Related to this, comes the tension derived from speculation. Tourism may cause a rise in prices for all kinds of products (from groceries to housing) or services, even those used mainly by residents. This is a clearly detrimental effect that especially affects the local community (Greffe 2003). When the prices are too high to be supported by the average income in the local community, some residents may be forced to leave the territory. This phenomenon, already identified in the 70s, has been defined as "gentrification". Most studies refer to it in urban contexts, when ocurring in historical cities or neighbourhoods, but is also well known in rural areas, e.g. with the boom of rural acommodation or the surge of hobby farmers (Cànoves *et al.* 2006, Philips 1993). At a smaller scale, others critisize the privatisation of formerly public heritage sites, the salective access to them by requiring an inflated entrance fee and the extravagance of some heritage recovery initiatives, such as some ecomuseums that should rather be named *egomuseums…* (Garrod & Fyall 2000) (see also below, on the value of heritage).

The carrying capacity of heritage is also a matter of controversy. A concept stemming from the public use management of natural protected areas, it has soon found roots in the concern about the social and biophysical effects of tourism and their role in contributing to sustainability. McIntyre (1993) defines carrying capacity as "the maximum use of any site without causing negative effects on the resources, reducing visitor satisfaction, or exerting adverse impact upon the society, economy and culture of the area". If we consider that just by "being there", as an outsider, can cause a detrimental effect[18], this definition seems of little use (Lindberg *et al*. 1997). It nevertheless offers a conceptual framework to uderstand the complexity of the idea and the difficulties implied in the numerical calculation. In fact numerous methods exist to calculate carrying capacity, but none of them probably reflects it in its fullness (McCool & Lime 2001). Also, any given area may have multiple carrying capacities, depending upon what criterion is chosen (McCool & Lime 2001, Stankey & MCCool 1984, Wearing & Neil 2000). Typically, it can be measured as the capacity of the site itself to host visitors, taking into account its fragility and conservation needs. It can also be measured as the psychological capacity of the public to enjoy the visit without being bothered by the pressure of other visitors[19]. While the first can be reasonably measured with scientific criteria, the second can be variable, according to the sensitivity of the public and the goals they have (e.g. to seek solitude vs companionship). Other measurements take into account the quality of life of residents (cities as Venice or Barcelona are well acquainted with this problem) or the effect on other economic activities in the area (e.g. the rural tourism monopolies referred to above) (Greffe 1999).

These threats do not only operate at local scale, but also at landscape level. The congestion of sites or the transformation of heritage values into *prêt-à-porter* assets for visitors affect landscape values. The visitor pressure may cause a degradation in environmental values such as water and air quality (e.g. noise) and the create the need of new infrastructures, with the environmental impact these may entail (e.g. new roads).

[18] A phenomenon well known by anthropologists engaged in participant observation

[19] In Spanish, a different term would be used for each case, respectively: *capacidad de carga* and *capacidad de acogida*.

On the other hand, the commodification or transformation of natural heritage values may force the creation of new landscape forms and structures and give rise to conflicts between the nature users (e.g. cattle owners and bikers) (Cebrián 2008).

The contribution of heritage tourism

From the point of view of tourism development, heritage has some virtues: It can be overtly promoted by public administrations; it is –in principle– free of charge and owned by society in general; it can be visited almost any time of the year and it offers an air of respectability to the travel experience. Despite these tensions, as said, authorities and the private sector tend to see heritage tourism as a tool to enhance the economic activity in their area of reference. Heritage tourism has many synonyms, depending on the focus of interest (e.g. cultural and ecoctourism, industrial tourism), location (e.g. rural, urban or beach tourism). For the purpose of this work, I will leave behind the latter two.

Cultural tourism is by no means a new phenomenon: already in the Antiquity, affluent people traveled with the purpose of solace, and the word "tourism" derives from the tradition of the *Grand Tour*, practised by well-to-do youngsters who completed their education by visiting famous monumental cities in Europe, back in the 18th century (Choay 2007). In the last decades, some factors have contributed to the universalization of this activity: a growing demand for leisure activities, a longer life span, a better schooling and the growth of a middle class (Greffe 2003).

Several authors have attempted to characterize ecocultural[20] tourists. Traditionally, visitors were clasified in terms of sociodemographic profile, but today, motivation is as much as important (e.g. McKercher & du Cros 2003, Poria *et al.* 2004, Prentice *et al.* 1998). A practical classification, akin to the stars provided by the Michelin restaurant grading system[21], is offered by Greffe (1999, 2003):

- *Specialised visitors* are those who who have a direct motivation to travel to the site. They represent 10-15% of the public

- *Motivated visitors* are those who do not travel for cultural purposes but accept to significantly modify their itinerary to access culture. They represent ca. 30% of the public

- *Ocassional visitors* are those who practice irregular cultural activities during their vacation, not travelling further than 50 km to do so. They are usually moved by fashion or external influence, rather than having an intrinsic cultural demand. They represent 45 to 65% of the public.
- *Residents*, a group normally not taken into account, but who will constitute an important source of revenue for cultural infrastructures. This group may present a high degree of fidelity, with repeated visits (whether alone or showing *their* heritage to others)

[20] Given the conceptual similarities between cultural tourism and ecotourism, I wiil refer to both of them as ecocultural tourism.
[21] The Michelin guide awards stars for fine dining establishments. A hierarchy of one, two, and three stars is used, their meaning being: For one star, "a very good restaurant in its category"; two stars, "excellent cooking, worth a detour"; and three stars, "exceptional cuisine, worth a special journey".

Current ecocultural tourists, originating from a hedonist, postindustrial society, seek meaning in their activity. Visitors will be better informed and will prefer destinations with ecological, ethical and social values. This may favour sites with sensitivity towards their heritage and that actively contribute to its conservation (Wearing & Nell 2000). Visitors want to actively participate in the experience, engaging in "creative tourism" that is, becoming producers of their own consumer goods and services on site (Richards & Wilson 2006). The global economic crisis has spurted an upsurge of so called slow travellers, characterised by travels within the region, especially to the rural areas; the search for wellness and health and short breaks and day trips (European Commission 2002, Ivars Baidal 2000, McIntyre 1993, Mitkova-Todorova 2002, Skumov 2002a, 2002b, Vodenska *et al*. 2002). An important motivation found in slow travellers is the quest for meaningful and participatory experiences (defined in German as *Erlebnis*) rather than witnessing people and places, as an outsider (defined in German as *Erfahrung*) (Bosshart & Frick 2006, Richards & Wilson 2006). Cultural tourism is no longer just an activity which presents artifacts to tourists, but one that takes into account the relationship between the visitor and the heritage presented, especially when including intangible heritage, which in turn helps visitors get "emotionally involved" in a "heritage experience" (Alivizatou 2006, Poria *et al* 2004, 2006, Richards & Wilson 2006). Hence, motivation of visitors is not only understood in terms of visitor's profile, but also in terms of involvement. Heritage tourism should be analysed from the flipside of the coin, that is, the perspective of the needs and desires of visitors, rather than by the attributes of any given site (Poria *et al.* 2001).

It has been shown that cultural tourism brings potential benefits to other sectors of activitity (Greffe 2003). Direct benefits may go to companies presenting heritage to the public (e.g. communications, engineering, design) and indirect benefits to those that profit from the presence of public enjoying leisure activities (e.g. hospitality, fashion, design), and these will, at the end of the line, revert to the conservation of the heritage and landscapes they depend on. Keeping sustainability in mind, these companies will attain the highest margin of profit if they focus on quality and creativity. An interesting example of "social synergy" are quality handicrafts, which combine both. They have the additional advantage of being unique and to transmit values of use and existence of the site. In a hedonist, postindustrial society, these objects offer a deeper meaning, beyond their mere instrumental or ornamental use. However, covering costs of production can be a challenge, since the demand is variable. Cooperation among producers plus direct dialogue with the final users is essential to attain economic sustainability (Greffe 2003). Among the benefits of the link between heritage tourism and local development, two groups may be distinguished: *A priori* benefits, among which are the creation of employment, increased profits and improved training of stakeholders. *A posteriori*, benefits include an improvement in quality of life, a better quality cultural tourism, enhanced social inclusion and stronger local development (Greffe 2003). However, it should be borne in mind that the economic benefits of tourism, especially in former industrial areas, can never fully compensate the losses resulting from the abandonment of the activity (Edwards & Llurdés 1996).

Industrial tourism can be considered a subtype of cultural tourism which refers to "the development of touristic activities and industries on man-made sites, buildings and landscapes that originated with industrial processes of earlier periods" (Edwards & Llurdés 1996). Industrial tourism constitutes a sector of economic growth, to name an example, the salt mines of Wielizcka (Poland) receive more than 1 million visitors per year (Patin 2012). It also contributes to improve the image of an area with a new territorial brand and "counteract public prejudices towards industrial areas in decline" (Xie 2006). An example of this phenomenon is the city of Bilbao, with its flagship Guggenheim museum as a symbol of its

transformation. At smaller scale, salt making sites in decline may also experience this perceived benefit once recovered.

One important benefit of heritage tourism is the preservation of the landscape that host(-ed) the heritage assets in question. Whatever the activity (agriculture, mining, industry…), the public will be able to gain a better insight if the landscape can be "read". In the case of operating salinas, the heritage will be alive. No reconstruction or reproduction will be needed, because the activity itself is preserving the landscape as it should be seen and understood (Wu *et al*. 2015). Hence, from a paradigm of "what can heritage do for tourism?" we have moved on to "what can tourism to for heritage?" (Silberberg 1995).

Rural tourism

Another type of tourism with similarities to cultural tourism, but with location-specific features, is rural tourism. It has been argued that rural tourism should be the paradigm of sustainability, given its dependence of natural and cultural resources. As Garrod (*et al*. 2006) state, "the fabric of the countryside is very much the lifeblood of rural tourism". Rural tourism planners have the additional responsibility to consider the care for landscape, territory and heritage as part of their business. However, this is not necessarily so. Rural tourism tends to be concentrated in areas of scenic interest or especially appropriate for the practice of sports, leaving other territories empty. Scenic villages close to big cities can be under strong visitor pressure, showing scenes similar to the examples named above, but very concentrated in time, especially during weekends and public holidays[22]. Some other areas specialise in certain activities, such as skiing, whitewater rafting, paragliding, etc., as is happening in certain valleys of the Pyrenees. Both cases, whether driven by a specific product or a specific activity, become monocultures and do not create a healthy socioeconomic territorial fabric (Cánoves *et al.* 2006, Cebrián 2008).

Speculation is also a threat to rural tourism. The subsidies to transform buildings into rural accommodation have not been strict enough in the past and some families have seen their chance to renovate their (second) residence at the cost of financial aids intended to promote rural tourism (pers. obs.). Neither there is a uniform standard to qualify these accommodation types. Often, rural areas have focused on accommodation but have neglected other services for visitors (activities, restaurants, shops), so that the offer is too poor to attract them.

A specific challenge of rural tourism and, for that matter, of rural development in general, are the tensions between old and new residents. Stemming from different cultures (rural vs urban) and generations, they encounter difficulties to understand each other's priorities and needs. Analogous to cultural tourists, visitors or, for that matter, new residents in rural areas, seek an identity that may be lost in time (Bessière 1998). In rural areas, this missing identity may be idealized and (unconscious) expectations to find a *Paradise Lost* can put pressure on the livelihoods of the local community. Part of this identity can be found through food, which epitomizes both the natural and cultural heritage of the region. Food is therefore an excellent vehicle to release tension between residents and visitors and link them via the production and the culinary preparation processes (Armesto & Gómez 2006).

[22] Near Madrid (pop. 3,2 million in 2014), for instance, there are some mediaeval villages (Pedraza, Torrecaballeros, Riaza…) specialised in offering roasted pork and lamb, with the scenic backdrop of the village and the attractiveness of its antiques and souvenir shops. The roads that lead there are nicknamed the "cholesterol route" and are literally jammed during the weekends.

Rural tourism has also numerous advantages for the territories involved (see Table 2.3). Authorities are now well aware of the need of creating synergies with other activities, going beyond the B&B model, and the need to offer residents a more diversified socioeconomic activity. Gastronomy is a good example of diversification (Armesto & Gómez 2006, Skuras *et al.* 2006). Efforts are being made to train professionals and promote entrepreneurship, often related to food production, sales or restaurants. Other indirect sectors are promoted, via innovative actions like "workshop schools" to teach local workers practical *blue collar* abilities, such as masonry, carpentry or electricity.

Local authorities invest in scenic beauty not only in urban settings, but at landscape level, and promote an image of environmental awareness and cleanliness. Rural tourism can thus be a paradigm of sustainability, provided it complies with the sustainable tourism standards established by the WTO (Cánoves *et al.* 1996):

- "Make an optimal use of environmental resources, keeping the essential ecological processes and contributing to preserve the natural resources and biological diversity

- Respect the sociocultural authenticity of host communities, preserve their cultural and architectural assets and its traditional values, contributing to the intercultural understanding and tolerance

- Ensure viable long-term economic activities that benefit all stakeholders and provide homogeneously distributed socioeconomic profits, by creating stable employment opportunities and the provision of income and social services for the host communities"

Many other traditional or alternative forms of tourism exist. They constitute variations around a theme (gastronomic, architectural, musical…), and activity (adventure, spirituality, sports…) or a place (rural, beach, urban…), some of which already named above. They may have specificities regarding the management, the public they cater to or the local communities and resources they rely on, but in the end, the features described here may in general terms apply to all of them. After all tourism –whether rural, cultural or any other– should aim at the creation of "sustained value" (Ryan 2002), which benefits the communities, businesses, visitors and the environment. This value relies "on local endorsement and ownership of the sites, including the involvement of communities and workers to foster social sustainability" (Wu *et al.* 2015).

Hence, rural tourism has similar challenges and opportunities than cultural tourism. Table 2.3 shows some of them, most of which have already been discussed above:

Table 2.3: Challenges and strenghts of (rural) tourism

Challenges	Strengths
Socioeconomic aspects	
- Unstable work conditions - Perpetuation of role models (women as caretakers for visitors) - Inflation of prices of housing and other commodities - High degree of seasonality - Need of complementary income - Profits may not reach the local community - Marginalization from the community's activities	- Diversification of rural economy - New demands of services and infrastructures - Promotion of innovative activities - Development of local products and handicrafts - New employment opportunities - Complementary income for families - Opportunities for youth / women - Reduction of rural exodus - Enhancement of return migration

Table 2.3: Challenges and strenghts of (rural) tourism (Cont.)

Challenges	Strengths
Cultural aspects	
- Commodification of local culture - Alterations in the social balance of the community - Rural gentrification - Tensions between old and new residents - Misuse of local identity	- Recovery of local culture - Strengthening of identity and community feelings - Promotion of self esteem and collective activities - Improvement knowledge of the area - Opportunities for cultural exchange between residents and visitors
Environmental aspects	
- Environmental impact of the tourist activity - Waste and wastewater generation - Noise and light pollution - Overconsumption of natural resources - Affection to local flora and fauna	- Revitalization of natural resources - Awareness raising on cultural and natural heritage, among residents and visitors - Maintenance of landscape mosaics and diversity - Recycling of old buildings

Source: Adapted from Cánoves *et al*. 2006

2.4.3 Rural development

One of the main pillars of rural development is the promotion of quality products and services. Rural areas have the advantage to count on a variety of endogenous resources, both natural and cultural. It is key to identify them and use them with care, but avoiding the hyperspecialisation that, on the long run, rather constitutes a factor of weakness. All sectors (productive, industrial, services) can benefit from different endogenous resources, provided there is an adequate planning, governance and assessment framework (Izquierdo 2002, van der Ploeg *et al*. 2000).

Table 2.4: Productive sectors in rural areas

Sector	Activity
Productive	- Organic farming* - Silviculture - Artisanal mining** - Aquaculture*
Industry	- Clean industry* - Renewable energies
Services	- Tourism* - Education* - Sports - Health care* - Spiritual services* - Research and development* - Teleworking - Online businesses* - Retail trade*

*Those that may create synergies with artisanal salt making
Source: Own elaboration

Besides form the efforts made by authorities to promote tourism with a broader view (training, embellishment…), others strategies –whether public or private driven– seem to contribute to the strengthening of rural economies. From the planning point of view, authorities are improving their performance with respect to coordination among themselves and between each other, at any level (from single farm to whole region), and with respect to participation and local governance. (Izquierdo 2002, OCDE 2006, van der Ploeg *et al.* 2000).

The latter allow residents to contribute to decide their future, empowering them, and strengthening their identity, self-esteem and sense of belonging (Pereira *et al.* 2004). These strategies are essential to enhance the socioeconomic tissue of the territory and to protect rural identities. Keeping environmental and heritage conservation criteria in mind, too, a number of potential sustainable rural activities can be offered (Table 2.4).

Key factors for success in the implementation of the activities are the improvement of telecommunications, the shortening of distribution channels or the optimization of the geographical location of key public services. But perhaps the most obvious action is the promotion of local products obtained by organic farming methods and the protection of their geographical origin with labels and certificates (see also Chapter 4). Food production has the additional advantage of touching upon some cornerstones of rural development (from socioeconomic development at local level, to territorial branding at larger spatial scales) (Lozano 2008, Tregear *et al*. 2007). Implementing quality and conservation ethics into already existing productive activities should be relatively easy: no radical changes are expected. It only requires a shift in attitude, from merely "traditional" to "sustainable" (van der Ploeg *et al.* 2000). In agroecology, a productive activity is considered sustainable when (Daly 1990):

- The renewable resources should be consumed at the same rate at which they are generated
- Non-renewable resources should be used by limiting the extraction rate to the rate of creation of alternative renewable resources
- Waste production rates should equal the assimilation capacity of the ecosystems receiving them
- Technology should provide the highest productivity rate per resource unit
- The scale of the economy should be established within the ecosystem's carrying capacity

The shift towards organic, quality product has its shades, too. First, the improvement of quality will attract competition from elsewhere. Prices will be higher because of the use of organic raw materials, but not all products or services understand the deeper meanings of sustainability. The organic food market becomes saturated and organic farming, as a way of life, can become trivialized (Lozano 2008, van der Ploeg *et al.* 2000). These are similar pitfalls to those found in (rural) tourism.

Not all the practices listed above will be feasible in one single territory, but most of them are compatible with each other. A good strategic planning should identify those that fit best with the endogenous human, natural and material resources on the spot and how synergies can be created between them. It should be kep in mind that all these interconnected practices have one feature in mind: the paradigm shift from specialised monoculture to multifunctionality. Rural development has a "multilevel, multiactor and multifacetted nature" (Bowens & de Master 2011, van der Ploeg *et al.* 2000).

2.5 Sustainable local development through heritage and landscapes

2.5.1 Sustainable development as a framework for local development

All along this chapter, the word "sustainability" has constituted a leading thread. It is clear that sound local development is strongly related to sustainability. But what is sustainability? The term "sustainable development" was popularized in "Our Common Future", a report published by the World Commission on Environment and Development in 1987 (WCED 1987). Also known as the Brundtland report, Our Common Future included the "classic" definition of this term: "development which meets the needs of the present without compromising the ability of future generations to meet their own needs". Of course, the term stems from a liberal perspective, in which nature (i.e. natural resources) is commodified, a view that is being contested from other currents of thought, such as eco-socialism. But even the idea of sustainability itself, originating from the need to limit growth as to allow the replenishment natural capital, risks being corrupted, as it is often used to disguise and justify the abusive exploitation of resources (Escobar 1995, Naredo 1997, Santamarina 2004).

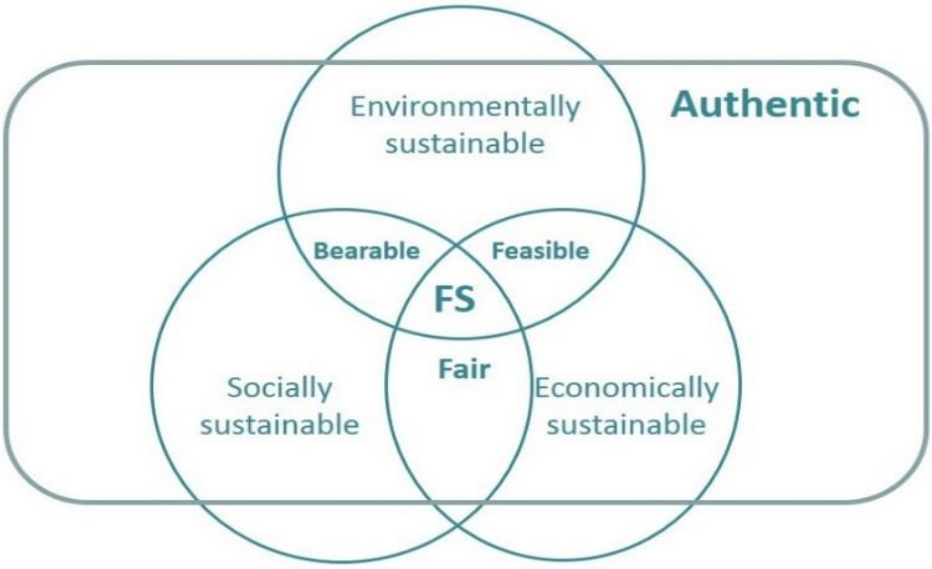


Figure 2.4: The road to full sustainability
(Source: Own elaboration)

To move away from the ideological arena and to grant it a practical application, the idea of sustainability has been further developed into numerous models, one of the most accepted ones is the so-called "triple bottom line", coined by John Elkington in 1994 (Slaper & Hall 2011). In its model, three spheres of action overlap as Venn circles, which express the need of considering economic, sociocultural and environmental aspects to achieve sustainability[23] (see Figure 2.4). Often, the most obvious sphere of sustainability and with which the term is usually confused, is environmental sustainability. This sphere refers to the sound use of natural resources, the choice of renewable resources (*renewable* being understood as either

[23] Some authors consider culture as a fourth, thus separate from the others, pillar of sustainability (e.g. Dessein *et al*. 2015, Hawkes 2001, Nurse 2006, Pereira & van Oers 2011, Throsby 1999, 2001).

as replenishable or well below the depletion level), the prevention of pollution, the preservation of natural habitats and biodiversity, an adequate environmental management, the compliance with environmental laws and regulations, etc. Supporting this one are the social and economic spheres of sustainability. The social sphere refers to an appropriate education, an adequate standard of living, equal opportunities, human rights, community outreach, preservation of cultural heritage, etc. Economic sustainability, on the other hand, refers to a balanced profit building, cost savings, resource efficiency, research and development, risk management, etc. When the different spheres of sustainability overlap, we achieve partial sustainability. The overlap between environmental and social sustainability is considered *bearable* and results in promoting fair trade, holding business ethics, attending to worker's rights, halting climate change… If environmental and economic sustainability overlap, it is considered *viable* or *feasible* and it results in attaining energy efficiency, creating incentives for conservation… Finally, if economic and social sustainability overlap, it would be considered *fair* and results in environmental justice, land stewardship and similar situations (e.g. Cortina 2010).

Additionally, the main commitment implied by the definition of sustainable development is, beyond preserving what today is relevant to us, to preserve what we believe will be significant to future generations. As Avrami (*et al*. 2000) indicate, "the prospect of stewarding for future generations the material markers of the past, imbued with the cumulative stories and meanings of the past as well as of the present, is the essence of conservation."

The sustainable management of landscapes or heritage does not necessarily mean that these should be static, as if they were frozen in a certain period of time of the choice of its managers. Both landscapes and heritage are dynamic by essence and sustainability also implies adaptation to the future. Thus, there needs to be a capacity to understand the dynamics of a landscape and adapt the changes to the needs of future generations without depleting the resources or affecting their livelihoods. There is a growing concern about the vanishing traditional cultural landscapes and their embedded heritage, the speed at which these identity-bearing elements are changing and the emergence of new landscapes (Antrop 2006). These changes are perceived as a threat, because they result in a "loss of diversity, coherence and identity of existing landscapes, which are considered as heritage values" (Antrop 2005, 2006). Sustainability is based on a delicate balance between natural, sociocultural and economic capital than can only be achieved by a slow and careful management. Rapid changes usually imply an unbalance between these factors (Antrop 2006).

2.5.2 Values of heritage and landscapes

Heritage and social capital

Culture and cultural heritage form part of one of the three spheres of sustainability, and are usually cited in discussions on socio-economic development, highlighting the potential of heritage as a means to create social capital (Greffe 2003). This type of capital is understood as "an important resource of individuals and social groups impacting on economic growth, democratic practices, quality of governance and quality of life" and "facilitating the achievement of goals that could not be achieved in its absence or could be achieved only at a higher cost" (Murzyn-Kupisz & Dzialek 2013). Social capital owes its strength to the density and quality of social links and networks in a given area and usually depend upon long-term

historical development processes. This quality can also be translated in a "feeling of connectedness, trust and the existence of traditional ways of transmitting skills as well as the wealth of traditional craft, production and agricultural activities", which are an important asset for local development. Rural areas are particularly apt for social interaction and, especially, for finding a community identity through heritage (Bessière 1998, Murzyn-Kupisz & Dzialek 2013).

Based upon the symbolic value of heritage, institutions have a role in the creation of local identity and feeling of cohesion. Therefore, heritage sites and related venues (museums, libraries) may contribute to build trust and create social networks. These locations endow themselves to facilitate meetings between groups which would normally or never have contact with each other, provide opportunities for the interaction with older persons creating important inter-generational links; a dialogue between the old (long term) and new inhabitants of a given locality takes place or the inclusion of persons and social groups in danger of marginalization (Bessière 1998, Murzyn-Kupisz & Dzialek 2013).

Besides from the constructive role in building social capital, heritage institutions also face some pitfalls that can undermine the positive effects. To start with, the link between cultural entities and local population tends to be weak, representing only social classes or groups with a certain degree of socio-cultural privileges. Hence, heritage-related activities may risk widening the gap between these and other, less privileged groups. A well-known phenomenon that represents this situation is gentrification, discussed earlier, which may lead to displacement of many long-term residents, the breakdown of close-knit communities, community resentment and conflict. Another related risk is the uneven distribution of costs and benefits from tourism, in which selected community members may benefit from it while the local community as such suffers, not only in terms of costs of preservation and infrastructure but also in social terms (Murzyn-Kupisz & Dzialek 2013).

Cultural ecosystem services of heritage and landscapes

On the other hand, the environmental economics has long ago acknowledged the ecosystem's capacity to supply services to society. Ecosystem services arise when an ecological structure or function contributes toward meeting a human need or want. Such services generate benefits that support overall well-being and are usually translated into utilitarian terms and expressed in direct (food, water, energy…) or indirect monetary value (regulation, pollution control, erosion prevention…) (Constanza *et al*. 1997, Daniel *et al*. 2012, Ministry of Agriculture, Food and Environment 2014). A broader notion of ecosystem services, that includes cultural services, has been brought by the Millennium Ecosystem Assessment (MA 2005), and is a way of expressing the tangible and intangible benefits which ecosystems provide to human beings (Daniel *et al*. 2012, Papayannis *et al.* 2008, Papayannis & Pritchard 2011).

The cultural services provided by ecosystems in general and wetlands in particular are very diverse (see also Table 4.1, Chapter 4). They roughly encompass landscape aesthetics, spiritual and religious significance, cultural heritage and landscapes, recreation and tourism (Daniel *et al*. 2012). The first two groups are rather subjective and very dependent on the cultural context and intimately linked to the individual perception and sensitivity of the user. On the other hand, cultural landscapes, as said earlier, are multidimensional and multifunctional. So, "essentially all landscapes are cultural, and subject to cultural influences, and a source of cultural knowledge" (Papayannis *et al.* 2008), they contribute to the

identities of communities and act as "vessels of cultural values" (Daniel *et al.* 2012). The traditional practices of landscape management can also provide aesthetic value and capacity of resilience. Recreation and tourism, on the other hand, arise as a consequence of all other services (aesthetic, symbolic or cultural landscapes as bearers of heritage).

Economic valuation of heritage and ecosystem services

Attempts have been made to put a price tag on the ecosystem services provided by nature, including those categorised as cultural or aesthetic ones. The authors have used hundreds of case studies and different economic valuation techniques for this purpose, although the debate is still on about the efficiency of these calculations (Balmford *et al.* 2002, Constanza *et al*. 1997, Daily *et al*. 2000, Hein *et al*. 2006, Kaminski *et al*. 2006, Naidoo *et al*. 2006, Pimentel *et al.* 1997).

The economic valuation of ecosystem services –including cultural– distinguishes several types of economic value, according to the purpose and the end user, which together conform the total economic value. A first division would be "use value" vs "non use value". The first refers to the present and future uses of resources provided by ecosystems. The direct use of resources is considered "direct use value" (e.g. water, food, biomass…), whereas the indirect use of them is defined as "indirect use value" (e.g. regulation services such as erosion control…). The value of the future use of resources is measured by the uncertainty of the possible future demand of an ecosystem service that is deemed essential today, and these values are defined as "option value". On the other hand, indirect values can be subdivided into "bequest values", that is, the possible use of resources by future generations, and the "existence value", that is, the value derived by the knowledge that the resource exists (e.g. acknowlegding the value of Antarctica although most of us will never actually visit it). This category also includes the so called "altruistic value", which refers to the knowledge that someone else benefits from a resource (de Groot *et al.* 2006, de Groot & Hein 2007, ME 2005, Pagiola 1996). Similarly, the value of existence of heritage refers to its capacity to offer an idea or an image of a monument, about the reality of a social group or community, or the brand of a territory (e.g. the Eiffel Tower in Paris or the Big Ben in London) (Greffe 2003).

As said above, numerous valuation methods have been used to attempt putting a price tag on ecosystem services and heritage. The most common valuation techniques are classified as direct market, indirect market, survey-based and benefit transfer. "Direct market valuations" are based on the exchange value that ecosystem services have in trade, public investments or expected earnings. (see de Groot *et al.* 2006 for a thorough review, see also de Groot *et al.* 2002, de Groot & Hein 2007, EEA 2010). "Indirect market valuations" are used when there are no explicit markets for services and based on the willingness to pay for certain services or to accept compensations for their loss. Among these methods, the "travel cost" and "hedonic pricing" are most related to tourism and heritage (Pagiola 1996, McLoughlin *et al.* 2006). The first refers to the amount of money visitors are ready to invest in travelling to a destination and the second, to the added price of services provided in scenic locations. "Survey-based valuation" gathers information directly from the users of the services, with respect to the value they assign to them. Given the fact that this is usually a hypothetical exercise, the value can be somewhat inflated. "Benefit transfer" can be defined as the use of monetary values obtained in case studies elsewhere, but with similar features.

These are used in case of human or financial constraints in the assessment of a site, but can of course lose accuracy. In any case, these methods are far from precise in most cases (for a critical review, see de Groot & Hein 2007, McLoughlin *et al.* 2006 and Pagiola 1996), but combining them can give an idea of the economic value of ecosystem services and heritage.

Can heritage and landscape be real drivers for socioeconomic development?

Again, as has been said earlier for heritage and culture, socioeconomic development can be defined from many different perspectives and is subject to permanent debate. Within the context of this work, it will be discussed in its relation to heritage and landscape. From an economic point of view, natural and cultural heritage has often been cited as the solution to slacking local development, especially in former industrial sites or isolated rural areas (see for instance Ashworth 2006, Bessière 1998, Greffe 2004, Pereira & van Oers 2011). The value of the so-called "countryside capital" is certainly not to be neglected (Garrod *et al.* 2006). Heritage satisfies a variety of needs–artistic, aesthetic, cognitive and even recreation, whether at individual or collective level (Greffe 2003, 2004). It mobilises the necessary resources for the conservation of monuments; it provides profits from the cultural tourism, it offers a positive image of an area, a "territorial brand", and improves the living environment. As Greffe (2004) says, "heritage thus provides the means of satisfying a wide variety of aspirations" (Ashworth 2006, Greffe 2003, 2004). Local authorities often rely on heritage as a panacea for their territories and are ready to invest huge efforts and resources with this view.

However, there are a number of risks that should be borne in mind before doing so. In general, the costs of activating and preserving heritage are often higher than the benefits. After all, most heritage is available at no cost for its consumer, but an investment needs to be done to create or activate it. In addition, heritage is ubiquitous, every local community, every territorial entity has it. This means there is strong competition both to activate and to offer it. On the other hand, the non-cultural demand for heritage by businesses not related to heritage (e.g. transport companies, hotels, fast-food outlets, etc.), can put pressure on the development of heritage sites as they hope to benefit from it. These businesses may not necessarily be able to bear the costs of maintenance and will merely act as stakeholders or pressure groups. Another issue to be taken into account is that the activation of heritage is subject to fashion and less stable than it may seem, needing permanent reactivation. Given the symbolic and dynamic nature of heritage, it may be used and interpreted in multiple ways. Each individual has his or her own perception and experience of heritage, which may or may not coincide with the expectations of the heritage institutions, and may lead to conflicts or discrepancies (Prats 1997, Greffe 2004, Ashworth 2006).

Within this context, I would here like to cite a passage by Gregory Ashworth, which I consider particularly realistic in this context:

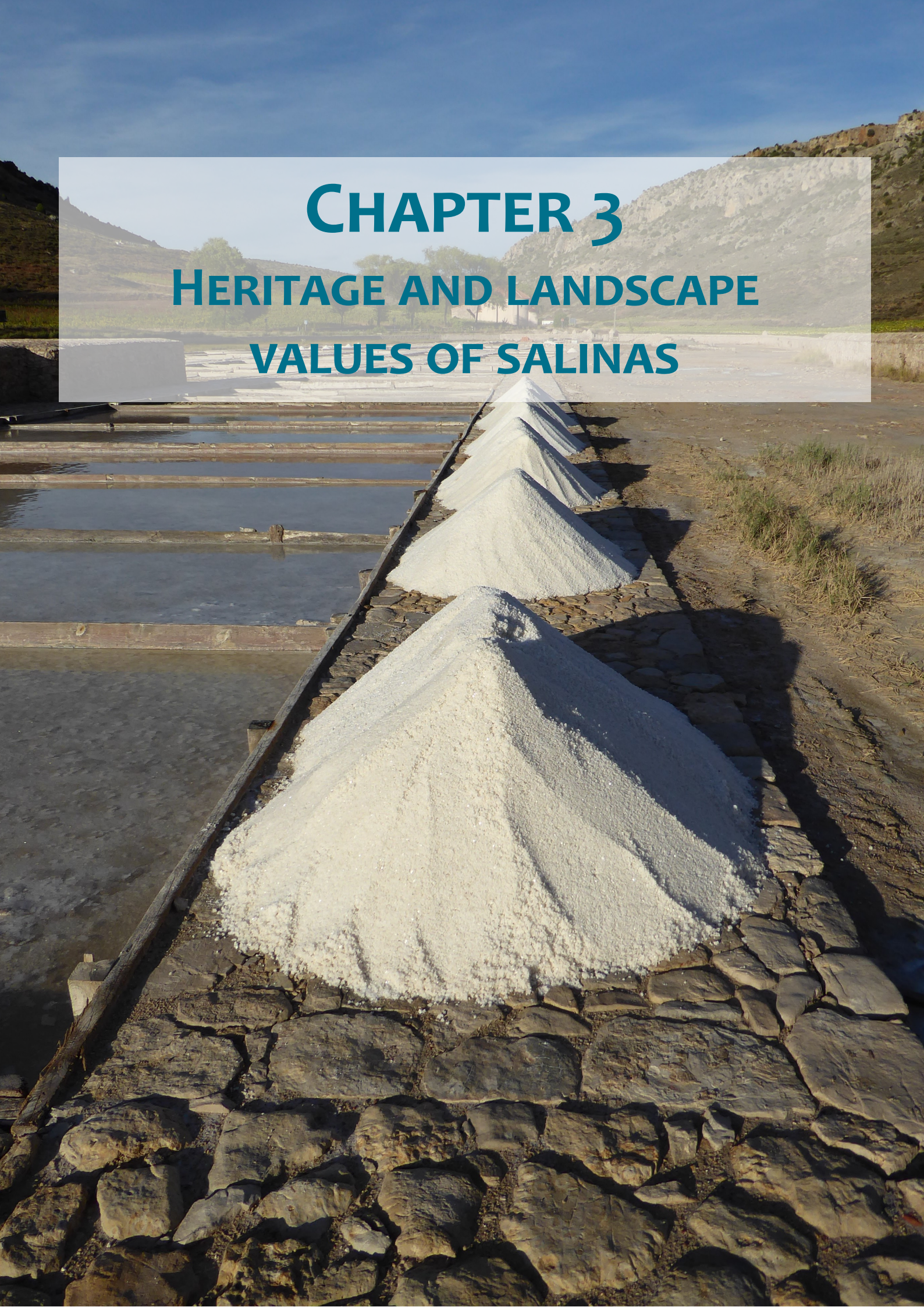
> "Heritage may confer many economic, social and political benefits upon the places where it is developed, but don't count on it because these benefits are not automatically endowed. There are many well publicised cases of success, but don't count on it, because there are many unpublicised cases of failure. There are economic, social and political winners in heritage development. However there are also losers. Heritage may be your economic salvation, your legitimation of government, your route to social cohesion and inclusion, your recognisable and acceptable place brand and your foundation for local civic consciousness and self-confidence. However, don't count on it" (Ashworth 2006).

In order to guarantee the economic sustainability of cultural tourism and recover the investment of the activation of heritage, some authors defend the "user pays principle", i.e. the costs of care and maintenance of heritage should be covered by those who enjoy it. This has lead to widespread criticism and accusations of elitism, which has resulted in the use of "token" admission fees that rather have an educational purpose, namely to raise awareness of the need to invest in heritage, but certainly does not cover all costs. In addition, heritage managers are wary to put an accurate price tag to their assets, because the see it as "commodification", while they understand heritage "has a value far beyond the price that can be put on it" (Garrod & Fyall 2000). A similar debate can be found when tagging natural heritage and biodiversity, and the need or not to charge the real cost of maintenance of natural protected areas (Laarman & Gregersen 1996, Richer & Christensen 1999).

Following Ashworth's advice (2006), this thesis will attempt at offering not only successes but also failures; not only good practices but also the lessons learnt. The question heading this section will most probably remain unanswered, but hopefully we will have gained some more insight towards answering it…

2.6 Conclusions

The purpose of this chapter was to offer a conceptual framework for the thesis, not only in terms of definitions and categories, but in providing an understanding of the relations between them, not always straightforward. The foremost conclusion is that the traditional division between natural and cultural heritage does not seem to serve the purpose in the context of cultural landscapes such as salinas, as many different types of heritage coexist in them (from the industrial activity to the natural vales of saline ecosystems, including also the idea of salt as being a food item) and cannot be considered separately. This also applies to the process of patrimonialization, which seems to be very similar both for natural as for cultural values. The process itself responds to a combination of symbolic, societal and utilitarian purposes, depending on the stakeholder involved (local community, private companies, policy makers), by which they obtain a sense of ownership and feel legitimised to use it for different purposes. The issue here is how these identities, interests and needs can merge and combine, creating the necessary synergies, so that a sustainable local development can arise from them. Important as well is the idea of multifunctionality of landscape-based heritage, a complex situation by which a cultural landscape has different values (in itself, but also to others), provides diverse ecosystem services and may constitute the physical support of a mosaic of functions for the local community. In the context of salinas, usually located in isolated regions, the comprehension of the basics of rural development and rural tourism is essential to understand how sustainable local development can be achieved in these settings. To this end, knowledge of the functions than can be provided at landscape level, stemming from both the economic as the symbolic values of cultural and natural heritage, is needed.



Chapter 3
Heritage and landscape values of salinas

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3.1 Introduction

After the theoretical analysis of the concept of heritage (in the precedent chapter), the aim of this chapter is to understand the influence of the salt making activity in shaping cultural landscapes, to acknowledge the diversity, ubiquity and abundance of salt heritage values, and a to discuss why these should be protected. Background information on salt as a commodity is provided, including the need of salt for human survival and the properties of this substance as a chemical compound. A significant part of the chapter is devoted to the understanding of salt making as an activity, with a description of the different modes of salt production according to geophysical (location, landscape, hydrogeological origin) and productive criteria (production method, scale, state of the facilities, source of energy, access to the hinterland). Attention is devoted to the dychotomies that have traditionally been stressed between industrial and artisanal salt making, the Atlantic and Mediterranean methods of production and the mining and agricultural character of the activity. Although most current salt making techniques will be briefly explained, the focus will be on traditional solar evaporation and a few words are said abound inland solar salt making, too, as almost all case studies of this thesis are these types of sites. Albeit superficially, this chapter will contribute to understand the relevant role of the production, distribution and trade of salt has meant to culture and heritage in different periods of History, as well as; the intangible heritage associated to traditions, cultural manifestations and the organisation of the work around salt making. It also provides an overview of the biological features and values that can be found in salt making sites and their relevance in the production activity. Finally, the causes and consequences of the abandonment of salt making for both heritage as for landscapes are discussed, and the reasons for the recovery of saltscapes and salt heritage are offered.

3.2 Salt, an essential commodity for humanity

3.2.1 The human "hunger for salt"

Salt, the only edible stone, is composed of 20% sodium and 80% chlorine. It is an essential compound for the survival of humans and other mammalian species. Sodium regulates the neuromuscular functions of the body, as well as the blood volume and pressure, by means of the so-called sodium-potassium pump found in the cell walls. The pump balances the concentration of ions between the intracellular and the extracellular fluids, by letting them pass from one side to the other by osmotic pressure. Sodium leaks routinely from our bodies in urine, feces, and perspiration, but an unbalance in the function of this pump may result in accumulation of liquids (œdema) and kidney failure when we cannot evacuate this excess[24]. Sodium loss happens in case of severe diarrhea, hemorrhage or dehydration, which may result cellular dehydration of our internal organs and, eventually, death by hyponatremia (Astrup 1993, Kaufmann 1960, Leshem 2009). On the other hand, chlorine allows the maintenance of the acid-base equilibrium in our organs (e.g. regulating the acidity in the digestive system) and facilitates the transport of carbon dioxide from the blood to the lungs. In addition, it plays a role as a disinfectant (Wang & Nauseef 2015). Salt also contributes to keep an adequate water balance and its deficit is, in fact, a severe problem for those people

[24] Sever hypernatremia can occur after (accidental) ingestion of salt, known as "salt poisoning" and is usually fatal. Cases of (non-)accidental salt poisoning regularly hit the medical and even general press (e.g. Astrup 1993, Moder & Hurley 1990).

exerting strenuous efforts, since they dehydrate very fast. It also seems to enhance the libido, a physiological feature that has had its translation as one of the symbolic values of salt (Denton 1982, Hueso 2011, Moinier & Drüecke 2008).

This need of salt in human diet has translated in a natural craving for it, even in infants, a phenomenon referred to as "salt hunger" or "sodium hunger" Sodium is an element that cannot be synthesized, it must be obtained from nature (Denton 1982, Leshem 2009, Schulkin 1991). Ungulates are especially sodium-deficient animals and are ready to travel great distances to search for it in nature. They tend to gather around the so-called "salt licks", where they can replenish the necessary minerals in their bodies. Even birds have been known to drink in salt licks (Schulkin 1991). Some of these salt licks have been transformed into proper salt making sites later by man. Famous is the legend of the wild boar that accidentally discovered the brine source in Salies de Béarn, a well-known salt making site in southwestern France. Carnivores are said to obtain the salt from the blood of their prey, as did humans probably did before they settled. Besides this evolutionary adaptation, the human salt hunger also has cultural implications. The shift from a nomadic, hunter-gatherer lifestyle to a sedentary, agricultural-based society has increased the need of salt, not for the sake of it, but to preserve food items[25]. Habit also seems to have an influence: well after the introduction of refrigerators, humans still crave for pickles and salt-cured foods (Leshem 2009). Aside from this, salt has numerous uses and applications (see below), which confer it an additional market value. Hence, this hunger for salt -whether physiological or cultural- has driven humans to collecting, harvesting or producing it in innumerable ways, and under the most varied conditions. In its absence, trade was needed to obtain it. This has triggered a universal influence of salt that has percolated in all fields of human culture.

3.2.2 Salt properties and the "14,000 uses of salt"

Salt in known to have multiple uses and applications, whether domestic or industrial, whether of instrumental or symbolic value. Also, the elemental constituents of salt –sodium and chlorine– have a broad range of industrial uses and applications. Salt is in fact the commonest and cheapest source for all chemicals containing one of these constituents. Substances as important as caustic soda (NaOH), used in the manufacturing of pulp, soap, glass; in oil refining, tobacco processing, etc. or hydrochloric acid (HCl), used in metal processing, cleaning, dyeing, tanning, in oil production, etc. are obtained from salt (Kaufmann 1960). Hence, some authors have referred to this diversity, as the "14,000 uses of salt" (Feldman 2011, Kostick 1993). This possibly inflated number derives from the different physical-chemical properties of salt, unique in their diversity and versatility. Thanks to these uses, salt reaches deeply into every segment of economic activity and its overall use constitutes a good indicator of the industrial wealth of a nation (Kaufmann 1960).

The overall production of salt in the world in 2015 was 273,000 million tonnes and salt reserves are considered inexhaustible, given the possibility to obtain it from the ocean. In this respect, it can be considered one of the only renewable minerals. The salt industry typically classified the uses of this commodity in four large groups: Food, industry, water treatment and de-icing. Despite the obvious association to food, salt is mainly obtained for the chemical industry, whereas the food-related purposes only accounts for 7% of the total

[25] Having said this, it is not clear yet how this transition has taken place and whether it was one-way evolutionary path. Nomadism and sedentarism have coexisted for a long time, and, to a very limited extent, they still do. Today, nomad societies trade salt or obtain it from natural salt licks and similar saline habitats (e.g. Farah *et al*. 2004, Goldstein & Beall 1990, Lovejoy & Baier 1975).

consumption. Of this figure, only half is destined to direct human consumption, that is, in the salt added at home[26]. Salt for de-icing roads in wintertime is one of the largest uses, too, although it fluctuates according to each year's weather conditions. Alternatives to reduce the amount of salt for de-icing are being sought, given the large environmental implications of adding salt to the soil and water near the roads. Beside these, salt can have many other applications. Some of these physical-chemical properties of salt and their associated uses are summarised in Table 3.1.

Table 3.1: Physical-chemical properties and some typical industrial uses of salt

Property	Use
Nutritive, flavour enhancer	Food condiment (table and kitchen salt), seasoning (processed foods)
Preservative, tenderizer, colour enhancer, enzyme inhibitor	Food industry (food processing and preservation, production of bread, flour, meat, cattle feed, etc.)
Dehydrating	Food industry (canning)
Bioactivity	Pharmaceutical industry (medicines, saline solutions), halotherapy (bath salts, salt chambers, thalassotherapy)
Lowering freezing point below 0˚C	Transportation (road de-icing)
Stabilizer	Construction (sealing of the bottom of reservoirs and deposits)
Fluidifying agent	Iron and steel industry (pure aluminium alloys)
Alcalinity enhancer	Paper industry (cellulose and pulp production processes)
Bleaching	Paper industry, textiles
Conductor	Electronics (microchips)
Flocculant	Oil and gas drilling (sludge cleaning)
Antioxidant	Iron and steel industry (steel cleaning)
Solvent	Mining industry (ore separation), production of dyes
Antiseptic	Leather industry (hide tanning and treatment)
Coagulant	Chemical industry (production of neoprene and gums)

Source: Adapted from Grupo Agrosa (1998), Kaufmann (1960) & Kostick (1993)

The best-known uses of salt are related to flavour enhancement and food preservation, both in domestic as industrial contexts. These are applied to any kind of food, not only those considered typical salted items (crisps, sauces, meat…), but also sweet or neutral food items (chocolate, yoghurt, jam…)[27]. The use of salt in the kitchen for these purposes is universal and some popular sayings refer to the lack or presence of salt as a personality trait. Some food items would simply not exist without the possibility to preserve them in salt (processed meat, pickles, sausages, cheese…). Salt is also used for a variety of domestic applications, such as cleaning, whitening, water softening or disinfectant. Other, more symbolic uses, are also widespread. Examples are offering salt and bread as a welcome gift, in Eastern European cultures, or putting salt in a corner of the house to prevent bad spirits from entering it, in East Asian cultures (Hueso & Petanidou 2011a).

[26] Data valid for Spain in 2008, from URL: http://www.institutodelasal.com/es/industria-salinera/estructura-del-mercado-de-la-sal-en-espana [Retrieved January 2017]

[27] This is the reason why salt-reduction campaigns target processed foods, a large but invisible source of sodium intake (Girgis *et al.* 2003, Webster *et al.* 2010).

3.3 Salt making: where and how

3.3.1 The geography of salt making in Europe

The Association of Friends of Inland Salinas defined "saltscape" as "any landscape type that whose elements are strongly influenced by the presence of salt and forms a defined ecosystem" (Hueso & Carrasco 2009b). Saltscapes can be natural –salt rivers, lakes, lagoons, meadows…- or manmade. The latter are usually created with the purpose of producing salt or improving the efficiency of its natural formation.

It would be a Herculean task to estimate the numbers or even the location of the world's saltscapes and salt production sites, or even those found just in Europe. Only partial results have been obtained. Marín and d'Ayala (1997) estimated the number of salt making areas in the Mediterranean in "100 large scattered enclaves which, up until recently, were home to more than 4,000 groups or individual historical saltworks". According to Sadoul *et al.* (1998) the number of salinas recognisable within the Mediterranean Basin amounted to 170. Partial inventories estimate the number of salt making sites (present and former) above 700 in Spain; 116 in Germany; and ca 380 in Greece (Carrasco & Hueso 2008a, Emons & Walter 1988, Petanidou 1997, Petanidou & Dalaka 2009; see also Table 1.2). Saline lakes (see also below) have not been inventoried as such and wetland databases tend to ignore small, temporary and ephemeral bodies of water, many of which are in fact saline. Worldwide, the surface of saline lakes constitutes 0,006% of the total volume of water, whereas freshwater occupy 0,008% (Shiklomanov 1990). This figure highlights the ostracism saline waters suffer at global scale. In Spain, references to ca 250 saline lakes and lagoons have been found (Hueso & Carrasco 2009a). In Europe, saline lakes of endorheic origin (that is, closed watersheds that tend to evaporate and concentrate the salts that come with the natural lixiviation of the waters that feed the lake) can be found in Austria, Hungary and Romania, among which the Neusidler See. Saline lagoons fed by brine springs can be found in France, Germany, Austria or the UK, although they are rather small. Isolated saline waters also exist in Greece, Sardinia, Sicily and Cyprus (Hueso & Carrasco 2009a). Although little is known about the historical number of salt making sites and other saltscapes elsewhere in the world, some areas like central Asia, northern Africa, Australia and the western Americas are likely to have been rich in such facilities. Even Antarctica has a fair share of saline lakes[28].

From the point of view of saltscapes, both natural and manmade, Spain is probably the richest and most diverse country in Europe, hosting almost 1,000 salinas and saline wetlands (Carrasco & Hueso 2008a, Hueso & Carrasco 2009a, see also Table 3.2). Thanks to its climate and geological features, most of these saltscapes are (former) solar evaporation salt making sites (71%), many found on saline grounds away from the sea (53% of all saltscapes are inland sites). The vast majority (97%) of the solar evaporation salinas are now abandoned and many even have disappeared altogether. Of the sites that remain active, there are over twenty inland and more or less the same number of coastal salinas (See Table 1.5 and Annex 3 for location in the map). Inland salinas are usually smaller in size, as they feed on brine with a relatively high concentration of salt that does not need much further evaporation. Besides, the amount of brine is usually limited to the flow capacity of the spring, which also constitutes a limitation of size. Climate in inland sites can be also a limiting factor, as the salt

[28] Incidentally, the world's saltiest lakes lie in this continent. The Don Juan Pond and Vanda Lake, located in the McMurdo Dry Valleys region, have a salinity level of 44% and 35% respectively. Both are higher than the salinity of Assal lake in Djibouti, which is 34,8%, the highest outside Antarctica (Marion 1997).

making season is usually shorter than at the coast, prone to frequent late-summer thunderstorms that may spoil the harvest. Due to their small size, short productive season and subsequent low profitability, few of these sites had been upgraded to an industrial scale and have been gradually abandoned in the past. Coastal salinas are usually much larger, as they need huge surfaces to evaporate the seawater. On the other hand, their limiting factor is the availability of flat ground rather than the brine, which made an upscaling to industrial size feasible, at least before the advent of mass tourism and the competition for land that comes with it. Smaller coastal salinas have rarely survived due to this strong competition of land use. On the other hand, the loss of salt mines has been less dramatic, although only one fourth remain active today. Besides the salt making facilities, Spain offers a great diversity of other saline wetlands, such as salt marshes and meadows, plus saline streams, springs, lakes and lagoons. Of the latter, some have been used in the past to obtain salt, albeit in a rather primitive manner and have rarely been proper salt making sites.

Table 3.2: Estimated number of saltscapes and salinas in Spain, according to their scale of operation and period of activity (see Figure 5.2 for the general location of the sites)

Type of Saltscape	Nr sites			
	Industrial scale	Artisanal scale	Aban-doned	Total
Salt mines	7	NA	25	**32**
Inland salinas	3	18+	ca. 500	**516**
Coastal salinas	12	8+	ca. 150	**173**
Saline wetlands	NA	NA	NA	**244**
Total saltscapes	**23**	**25-30**	**ca. 680**	**965**

Sources: Carrasco & Hueso (2008a), Hueso & Carrasco (2009a), IGME (2011), ISAL (2014), IPAISAL unpublished data

3.3.2 The geophysical features of salt making

Salt production sites are found all over the world in very different geomorphologic, climatic and cultural contexts, which determine the types of materials, construction techniques or even production protocols in each site. Salt making sites were designed considering the local topography and using locally available materials, and were built according to the salt-making knowhow of the time. Salt making techniques have also changed in time, from the first Neolithic, salt making by *briquetage* to present day vacuum facilities, or the harvest of salt by hand vs with heavy machinery. Salt making can be considered a mining, industrial activity as well as an organic farming type of production, all depending on the methods used and the setting.

Europe is especially diverse in salt making techniques, as shall be seen in the next chapters, and therefore it may be useful to provide a set of definitions of salt making categories according to different criteria (Table 3.3). These are classified in two large groups: geophysical factors and productive factors. The first are descriptive, that is, relate to the environmental conditions of the site. The second include the choice of productive method, scale as well as other features, made by the managers of the site. This section provides a brief explanation of the different categories provided in the Table, with special emphasis on the traditional solar evaporation sites. Examples are provided of all cases cited. Given that one site responds to the different criteria, these examples may overlap. Tables 5.2 and 6.1 offer a description of the study sites according to all the features in Table 3.3.

Location

Salt making sites can be located both on surface level as underground. The first are typically found at the coast, in inland natural saline wetlands or in artificial wetlands. In Europe, these can be solar evaporation or seething facilities. Underground salt making sites can be rock salt mines, open cast mines (by which the salt is partially exposed to the surface) or use solution mining techniques. The physical location of the resource determines the type of salt making facility (see also below). Salt *mines* are usually found where underground solid salt (also known as halite) deposits are. Salt is usually extracted by traditional mining techniques, most often by the chamber and pillar method. This technique can be seen in certain mines open to the public, such as Slanic Prahova or Salina Turda in Romania. Open pit salt mines were not that common, due to the rain washing the salt that may have been exposed. However, some mining locations also have open salt diapirs that may have been exploited in the past. Examples are Cardona in Barcelona or the above mentioned Slanic Prahova.

On the other hand, solution mining used to be rather common, although quite expensive. In these sites, high pressure water is injected into the beds and the salt is thus dissolved. The resulting brine, supposedly cleaner from impurities, could then be evaporated. A traditional version of this technique is still practised in Poza de la Sal (Burgos), whereas a modern version can be found in the salt mine of Remolinos (Zaragoza). Vacuum facilities pump brine from the underground, at relative great depths, and use a series of tanks with successively decreasing pressure to separate water from salt and a fine-grained, highly purified salt is obtained. Another type, inland salinas, also referred to as continental salinas, are those fed by brine springs, rivers or salt lakes. If the brine does not come naturally to the surface, it should be pumped. A variety of pumping methods exist, from wheels moved by animal force to windmills or modern electro-mechanic devices. Coastal salinas use sea water to obtain salt. The water may enter the salina naturally (by the force of the tides, gravity of filtrations) or needs to be pumped. More details on the functioning of coastal and inland salinas will follow below.

Salt or saline lakes are naturally occurring water bodies which have a certain degree of salinity. This may result from the contact of water with underground -or, rather, *underwater*– brine springs; or may be of endorheic origin. Salt lakes can have ephemeral or seasonal character, with fluctuating salinities or, more rarely, can be stable both in size as in salinity. Occasionally, the lake dries up and a salt crust is formed, that can be directly harvested from the ground. Otherwise, the brine is directed towards evaporation basins built on the shore. Not many lakes have been used for salt harvesting purposes in Europe, as the salinity was usually too low or the climate too humid. But good examples can be found in Spain, such as the Quero (Toledo) or Bujaraloz (Zaragoza) lagoons. In prehistoric times and up to the 17th century, salt was also obtained from the Laguna de Villafáfila (Zamora).

Landscape

The type of landscape in which salt making sites are located is determined both by the geomorphology of the terrain, as well as the type of wetland they constitute. The landscape categories offered here do not respond to official classifications (Mata *et al*. 2003, Román 2014, Wascher 2005), but simply to a general descriptive aspect. According to this, the following types can be distinguished: Mountains, slopes or terraces; valleys, and flatland or tableaux. Mountain salinas are in a type of landscape dominated by mountains or hills and the salinas themselves need to adapt to the vertical or irregular shape of the terrain. They

can do so by taking advantage of flat portions of ground, on manmade terraces or building the salina on stilts and platforms. All of them are inland solar evaporation sites in Spain. The first case can be seen in the salinas of Royuela in Teruel, whereas the second is typically seen in Peralta de la Sal, Nuévalos in Zaragoza or Cambrils in Lleida. The only two relatively well preserved cases of salinas built on platforms are Poza de la Sal and Añana. Most of the mountain salinas have disappeared. Given their isolation, generally smaller size and difficult access, these were the first in being abandoned. Other salinas are located in the bottom of a valley or at least in its lower portion, taking advantage of the nearby brine wells and the availability of clay and wet soil. Examples of these are Belinchón in Cuenca, Calasparra in Murcia, Naval in Huesca, Iptuci in Cádiz or La Malahá in Granada. Of the study sites, these are Arcos de las Salinas, Espartinas, Gerri de la Sal, Rambla Salada and San Juan. Again, many of them are found in remote, difficult to access locations and have suffered an early abandonment. Finally, the salinas located in flatlands or tableaux are possibly the easiest to build and largest in size. Examples of these are most of the salinas of the Guadalajara province, such as La Olmeda, Bujalcayado or Armallá; or Ojos Negros in Teruel, Monteagudo de las Salinas in Cuenca, or Fuentealbilla in Albacete. Of the study sites, Imón is paradigmatic. Also, most coastal salinas -except for a few exceptions in shallow cliffs such as El Bufadero in Gran Canaria- are located on flat terrain. Other types of salt making facilities such as seething or mines are found in a variety of landscapes but are not relevant from this point of view, given the small size of the (aboveground) facilities.

Looking at wetland type, the most predominant models in salt making sites are saltmarshes in the coast and built wetlands, when found inland. Typical cases are the Bay of Cádiz, the Odiel marshes in Huelva or the Po delta in Italy. Another typical type of coastal salina is the lagoon, often found in the Mediterranean. In Spain, the best-known example is the La Mata lagoon, feeding the salinas of Torrevieja; elsewhere in the Mediterranean, examples are the Messolonghi lagoon in Greece or the Molentargius lagoon in Sardinia, the Camargue in France and, of course, Sečovlje in Slovenia. Some of these marshes are situated in the deepest portion of a gulf, areas in which there is a stronger evaporation and thus concentration of seawater, while being protected from adverse weather phenomena. Coastal salinas, however, can be more diverse. In the Atlantic façade, estuaries are also favourable sites for salt making, as they are protected from tidal surges and the microclimate is slightly warmer and more stable. This is the case, for instance, of the Rías Baixas in Galicia (the old salinas of Vigo), or the Portuguese rivers Vouga (salinas of Aveiro), Mondego (Figueira), Sado (Setúbal), Tagus (Alcochete), the latter two inactive. In France, the best-known example is the estuary of the river Loire (Guérande), but other estuaries worth mentioning are the Seudre (Mornac) or Gironde (Saintonge, now abandoned). Salinas built on rocks are typically found on the shores of the Canaries, Croatia, Malta or the Peloponese, to name a few.

Inland salinas can also be very diverse from the point of view of wetland type. Most solar evaporation salt making sites are built structures that artificially create a wetland, fed by underground brine springs. However, some are built on saline lakes or lagoons, such as the salinas of Quero in Toledo, Fuentedepiedra in Málaga, Bujaraloz in Zaragoza or Villafáfila in Zamora. These sites are inactive now. Elsewhere in Europe, the most prominent example are the still active saltworks in lake Tuz, in Turkey. Salinas associated to rivers and streams can also be found, such as the salinas of Rambla Salada. Other examples are rare in Europe, but common, for example, in Morocco. Other types of wetlands are uncommon: the salinas of Junqueira, in Portugal, abandoned a few decades ago, are located on peatland. Again, other types of saltworks (mines, seething) do not create associated wetlands, as the salt making activity takes place indoors.

Hydrogeological origin

The hydrogeological origin of salt is a complex issue that deserves much more attention than can be provided here. Very simply put, salt can be found in nature in solid or dissolved state. Solid salt is typically located in deposits and sediments of evaporitic origin, that is, beds of salt crusts that have resulted from the successive evaporation processes of ancient seas and that have been subject to strong tectonic pressure during millions of years. When the layer is thick enough and the sediments on top have caused enough pressure, the bed of salt becomes solid rock. Another origin of salt in solid form are domes or diapirs, which are isolated pockets of salt with a lower density than the surrounding materials and retain a certain degree of plasticity. The salt is usually mixed with clay and gypsum and, although present as a solid, is not as stable as rock salt and tends to "float" towards the surface, just as a drop of oil would do in water (García 2017, Warren 2010). Diapirs are usually found underground (famous examples are the Great Kavir in Iran or Poza de la Sal in Spain) but sometimes can be partially open to the surface, as is the case in Cardona or Salinas de Oro, Spain.

Brines can be of different origin. Those resulting from the partial evaporation of seas are known as "thalassohaline", whereas those originating from soil weathering and accumulation in depressions of the terrain, are named "athalassohaline". The main difference between these two is its ion composition. While the first, no matter how ancient, quite resembles the composition of seawater, the other may vary considerably. Within the context of this work, I will focus on the first, although it may be worth mentioning that there are quite a few athalassohaline lakes in Spain, notably Lake Chiprana, in Zaragoza; Gallocanta in Teruel and Zaragoza and Fuentedepiedra in Málaga. Other saline lakes are relicts of seawater or feed from thalassohaline brine sources, such as Villacañas in Toledo or Villafáfila in Zamora (Alonso 2009, Comín & Alonso 1988). Brines derived from ancient seawater can be found, surfacing as springs or confined underground. Phreatic brine pockets exist, such as those in Læsø (see Chapter 6 for more details), or much deeper in inland regions, but most commonly, brine approaches the surface by pressure of the uprising phreatic waters. The underground freshwater derived from the percolation of rain and surface running waters, comes in contact with evaporitic materials in the soil and dissolve them on the spot (Alonso 2009, Warren 2010). This is the reason why the wells feeding inland salinas have a weaker salinity in spring and early summer and are most concentrated at the end of the summer, when the water has had the time to dissolve the surrounding salt. Seawater can also contain pockets of brine at deeper levels, and is pumped to the surface to obtain salt. This method of salt making is not practised in Europe, but at last one Japanese saltworks does so.

In this context, it is worth mentioning that already in the Antiquity, several types of salt were distinguished, depending on their hydrogeological origin. These were *montanus sal* (rock salt, which needed to be mined); *salis flumen* (salty rivers and, by extension, salt from brine springs) and *sal marinis* (salt from the sea). Together, these were known as *sal naturalis* or *sal nativus*, that is, salts that naturally occurred in nature. In contrast, *sal facticicus* was the type of salt that needed to be made, most probably referring to seething or late briquetage methods. Similar denominations existed in Greek, although these were more focused on salts from marine origin, whether from the coast or estuaries[29] (Martínez 2005).

[29] Already in the Antiquity, the term *flos salis* is mentioned, referring to the thin and light salt that crystallise on the surface of the brine. The underlying brine was called *salsugo* or *salsilago*. The *flos salis* should not be confused with the *robigo salis*, formed in the edges of crystallizers, the so-called scales (Martínez 2005).

Table 3.3: Features of salt making according to different criteria

Criteria	Features			
Geophysical				
Location*	Surface	Inland salina Coastal salina Salt lake / river / stream		
	Underground	Open cast mine Rock mine Solution mining		
Landscape*	Geomorphology	Mountain / Slope / Terraces Valley Flatland / Tableau		
	Wetland type	Coastal	Shore / rocks Lagoon Marsh Estuary	
		Inland	Built wetland Saline river / stream / lake Peat	
Hydrogeological origin	Solid salt	Lake bed (evaporitic) Rock salt bed / sediment (evaporitic) Diapir / dome (volcanic)		
	Salt water	Thalassohaline	Surface	
			Underwater	
			Underground	Aquifer (ancient seawater) Freshwater (in contact with evaporitic materials)
		Athalassohaline	Endorheic waters	
Productive				
Production method*[30]	Disappeared	*Briquetage* Selnering Sleeching Seaweed burning** Freezing seawater		
	Traditional	Solar evaporation (open air) Open fire seething Graduation** Rock salt mining		
	Modern	Solar evaporation (greenhouse) Modern seething Deep sea pumping** Reverse osmosis Vacuum		
Scale*	Primitive Artisanal (forced vs facultative) Semi-industrial Industrial			
Source of energy	Renewable (sun, wind, geothermal…) Non-renewable (wood, coal, gas…)			
Access to hinterland	Urban – main road Rural – secondary or dirt road Isolated – footpath, not fit for vehicles			
State of the Facilities*	Active Inactive Abandoned Ruined Disappeared			

*Criteria of special interest within the context of this thesis (will receive more attention)
**Methods of partial evaporation
Sources: Own elaboration, adapted from Hueso (2015a) and Carrasco (2017). Similar tables can be found in Bitterman (2010), Román (2014) and Weller (2002).

[30] More thorough descriptions of salt making methods can be found in Brownrigg (1748), Fielding & Fielding (2006), Figuier (1873-1877), Geertman (2000), Hocquet (1989), Leenders (2004), Petanidou (1997), van Geel & Borger (2005), Westphal *et al*. (2012), Williams (1999).

3.3.3 Productive features of salt making

The second set of criteria on Table 3.3 focuses on the productive aspect of salt. First and foremost is the choice of production method, which largely depends on the availability of the mineral (solid or dissolved; amount of salt or average flow of brine and location), the type of landscape (i.e. geomorphological conditions) and the prevailing climate. Some salt making methods have become obsolete, due to non-sustainable practices or the tremendous effort needed in terms of human and material resources, today considered irrational. Others, on the other hand, have not changed substantially in centuries, as they serve their function well. Yet others are innovative, both from the technological point of view as the location. Climate and the availability of resources will also determine the source of energy needed to obtain the salt and, in some cases, renewable energies can be used, whether directly or indirectly, by applying state-of-the-art technology. The market then influences on the scale of the operation, both in relation to quality and quantity of salt demanded, and, to this end, the distance and accessibility to target hinterland is very relevant. Finally, from the point of view of heritage recovery, the state in which the salt making facilities are found will determine to what extent and how a given site can be patrimonialized. All the features included in Table 3.3 are discussed below and examples are provided. Again, some examples may overlap, as they serve as paradigms for different features.

Production method

Salt, being such an important commodity, has been obtained and still is in certain parts of the world, by very diverse methods. In Europe, most have been rationalised and only remnants exist of ancient systems. Among those that have traditionally been used, only the most efficient in terms of technical and human resources have survived.

Besides from the mining techniques described above the most common methods to obtain salt were solar evaporation and seething, still in use. *Solar evaporation* consists of spreading seawater or brine on large, flat and shallow basins and let the sun and the wind evaporate the water to form salt crystals (see Figure 3.1a). To this end, a warm, windy and dry season is needed. These facilities are widespread in the Mediterranean region and certain areas of the Atlantic. In the case of inland salinas, another limiting factor is the amount of brine that can be obtained, so that enough salt can be produced. In some cases, solar evaporation salinas located in unstable climates or wanting to make use of a longer season, use certain techniques -explained below- that ensure the safekeeping of the harvest, as occurs in Añana or Poza de la Sal, or are protected with shelters. These are high enough to allow proper ventilation, or can be removed upon request. An example of these (fixed) shelters can be found in Salinar de La Rolda in Naval, Huesca. More details on traditional solar evaporation salinas are given in the next section.

Seething is also known as forced evaporation and consists of warming the brine to the point of ebullition which is put into a vessel that rests on top of a source of heat (see Figure 3.1b). It is an improved version of the primitive briquetage (see below), which evolved into domestic-sized permanent pans set on open fire pits, such as those in Leintz Gatzagak in Guipúzcoa. One of the few seething facilities in function today, the saltworks of Læsø, also makes use of wood to make an open fire, but using larger pans. Until halfway the 20th century, this salt making technique was rather common and had even been industrialised, as can be seen in Lüneburg in Germany or the Lion Salt Works in the UK, today operative as

museums. They use bigger pans, usually made of metal, located in large industrial buildings. Heat is provided by any kind of fossil fuel (wood, charcoal, gas, electricity.

Among the techniques that have disappeared, the most common was *briquetage*, a primitive form of seething. This was almost the only method used in prehistoric times, regardless of the location. Brine or seawater was introduced in ceramic vessels and put on a fireplace to boil. Once the water had disappeared, the salt remained in the bottom of the vessel, which had to be broken to release the salt. Archaeological salt making sites are characterized by the large amounts of broken vessels found, hence the name of the technique. Given the need of salt and the difficulties in transporting it, remains of this activity are found ubiquitously (in lakeshores, rivers, estuaries, coastal lagoons, near brine springs, etc.).

Quite common in northern latitudes was the combination of seething and *graduation*. The latter is a technique used to concentrated brine by exposing it to the wind. It was used in cooler, wetter climates in which solar evaporation was not possible. Graduation towers (see Figure 3.1d) were tall structures made of tightly tangled twigs and branches, set up as a wall. The brine drippled from a canal dug into a trunk that lie longitudinally on top of the wall. The branches slowed the process of falling and allowed the wind to evaporate part of the water it contained. The brine that was collected at the bottom of the wall was thus more concentrated. This technique was not applied to crystalize the salt, but it allowed to spare fuel in the process of seething, as the brine was more concentrated and needed less evaporation time. Graduation towers can still be seen in many parts of Europe, mainly Germany, Poland –especially well known is that of Ciechocinek– and Denmark. In some places, brine is still percolated and visitors benefit from the health effects of the salt spray it entails (see also Chapter 7).

Other, less known techniques were in use in preindustrial times. Salt could be obtained from burning seaweed, seagrass or plants drenched in brine or seawater. These plants would be dried and then burned. The resulting ashes were washed and a relatively clean brine was obtained. The brine was then evaporated by means of other techniques (usually seething). A specific version of this technique is *selnering*, by which the Dutch used to collect peat, dry and burn it as described. This is in fact the origin of a few contemporary polder landscapes in their country. Similar to this was the washing of sands, especially those found in intertidal zones, which contain a relatively large amount of salt. This was a common technique in the UK's estuaries and coastal areas.

The advent of high quality salts has caused an upsurge in modern salt making facilities, whether making use of old solar evaporation sites or newly created premises (Beltran 2008, Hueso 2015b). Today, several smaller seething facilities are operating in locations that have never been linked to this activity before. Thanks to the availability of cheap fuel or by making use of renewable resources and the readiness of customers to pay higher prices for salt, small saltworks are active in the UK and Scandinavia. Such is the case of *Nordur Salt* or *Saltverk*, two seething facilities located in Iceland, using geothermal energy for heating the brine. In some locations, rooftop greenhouse solar evaporation is being introduced, as well as using ocean water or deep sea brine. A small company based in Barcelona even sells a DIY salt making kit, consisting of a small tray and a bag of seawater. On the other hand, modern technology is also used to raise the efficiency of industrial saltworks and gradually, desalination plants are being used for obtaining salt as a subproduct.

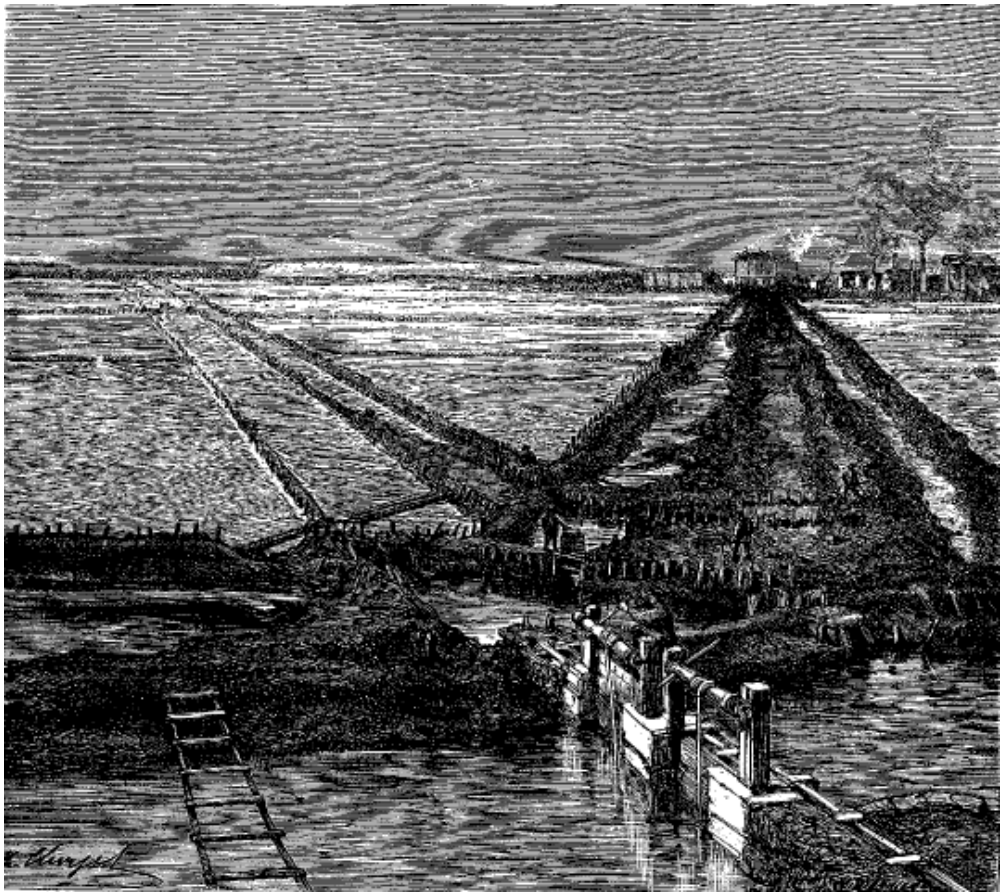
Scale

Salt making techniques may also differ from the point of view of the scale of operation. Today, most common are the *industrial* facilities, both solar evaporation and mining. Seething is not considered profitable at this scale. In these, most of the activities are mechanized. On the other side of the spectrum, and of special interest in this work, are the *artisanal* sites, which are those that continue using non-mechanised processes and tools made with traditional materials and even the maintenance or reconstruction of the facilities are done by hand. Most of them are old sites that keep using old-fashioned methods. Artisanal sites may be *forced*, that is, their owners or managers do not have the capacity to choose the scale of operation and keep working as their predecessors did, in the hope to survive. If there is a conscious choice to operate at artisanal level, whether for economic, social or environmental reasons, these sites are considered *facultative* artisanal. Some of these may, though, be modern by design and materials, such as the newly created seething sites in the northern Atlantic or some new solar evaporation sites in Iberia. In between the two categories are the *semi-industrial* facilities, in which parts of the process are mechanised, but others are still hand-made. Some of these exist in remote rural areas of Spain, where the salina retains some loyal customers, but whose product has the formal consideration of being industrial and often fails to meet high-quality, food grade standards.

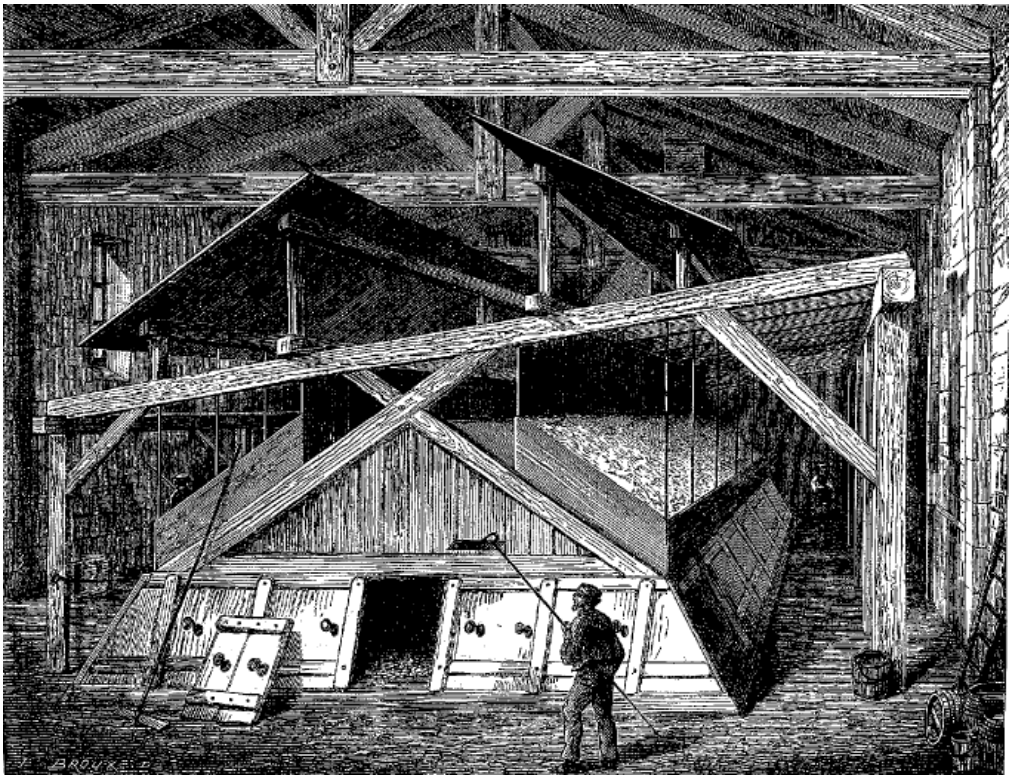
Last but not least, there still exist the so-called *primitive* salinas, which are those that have a minimum design and profit from the natural qualities of the terrain. These are normally located in rough coastal areas with irregular rocky shores, in which small pools are carved to collect the water that washes them during spring tides of regular high tides. The salt crystalizes by itself and is regularly collected. Examples of these are salinas del Bufadero in the Canaries or several sites in the Peloponnese, in Greece. A similar situation can be found in some salt lakes, in which the naturally formed salt crust is collected. An example of this is Chiprana.

Source of energy

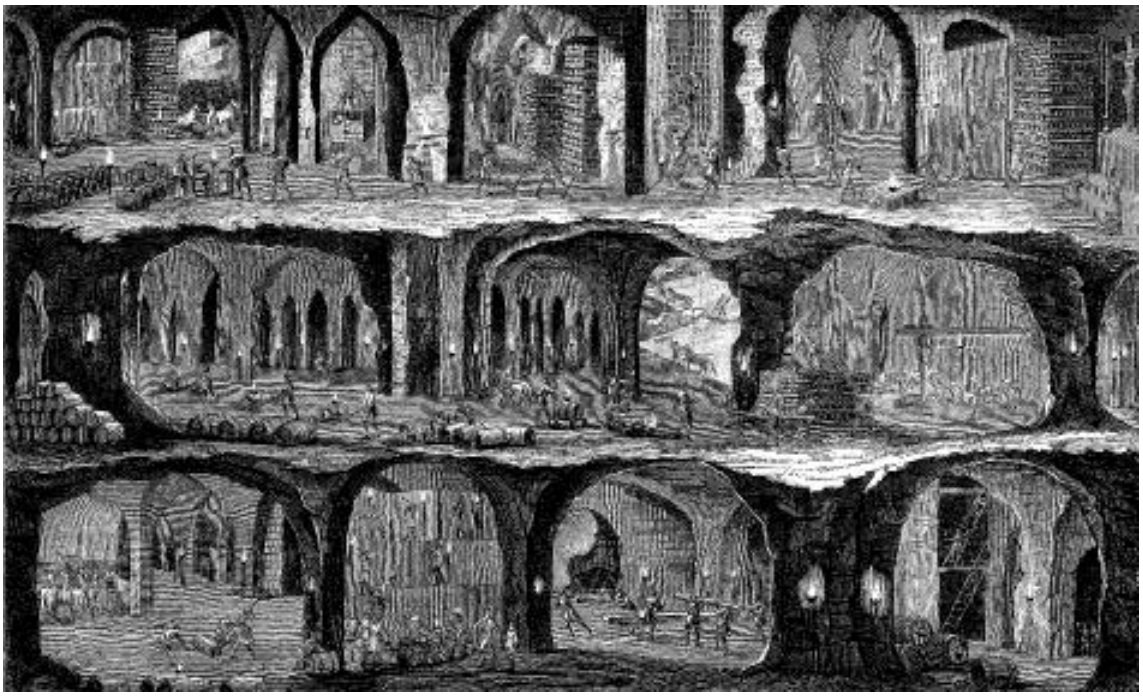
Solar evaporation salinas are said to be carbon-neutral, renewable activities. Not only they harvest an inexhaustible resource, but they do so by using the sun as the main source of energy. In traditional solar evaporation, not even a solar plant or wind farm needs to be installed: the beneficial combined effect of the sun and wind is obtained directly. In saltworks where graduation or greenhouses are used, the wind and sun also play a direct role. Hence, regions with a warm, stable and dry climate, at least part of the year, are clearly favoured to produce salt. The use of modern renewable resources, that is, by transforming energy in an industrial plant, is not very common. In the above-mentioned seething facilities in Iceland, geothermal energy is used, this time with the necessary technical adaptations to the needs of the saltworks. From this standpoint, briquetage first and seething later, have traditionally been one of the most energy consuming processes to produce salt. In the salinas of Læsø, it is speculated that the activity depleted the forests of the island (see also Chapter 6). Larger industrial saltworks, such as Lüneburg in Germany or Lion Saltworks in the UK have had a significant impact on the landscape. The famous *Lüneburger Heide* (Lüneburg Heath), now a natural protected area, resulted from the depletion of wood in a large area, as Lüneburg was one of the main providers of salt in the Hanseatic League (Petanidou & Dalaka 2009). Today, modern seething facilities use electricity, such as in Salies de Béarn in France, which is obtained from the grid. Whether this electricity comes from renewable resources or not, is the decision of the company.



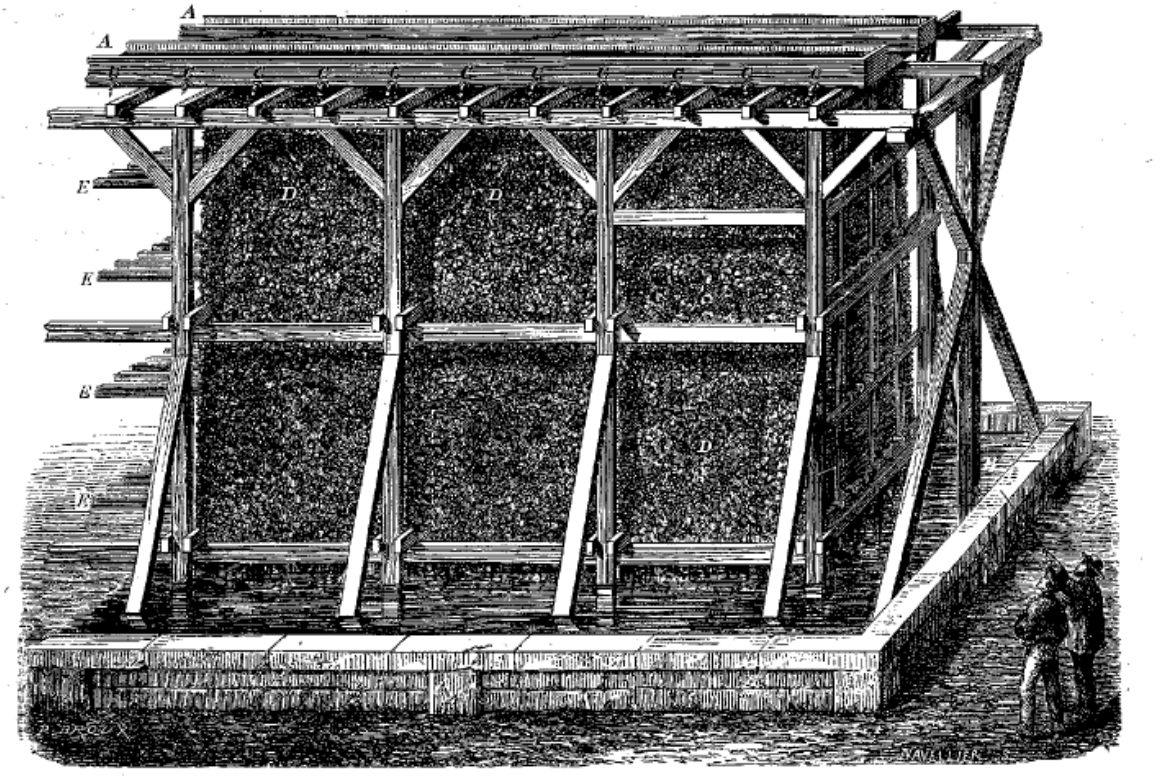
a. Solar evaporation salina in the Camargue, France (Figuier 1873-1877)



b. Salt boiling hut in Lorraine, France (Figuier 1873-1877)



c. Salt mine in Wieliczka, Poland (Figuier 1873-1877)



d. Graduation tower in Salzburg, Austria (Figuier 1873-1877)

Figure 3.1: Traditional salt making methods, according to Table 3.2

Access to hinterland

Traditionally, rapid access to markets was a competitive advantage for salt producers. This is one of the main reasons for the abandonment of salt making sites. Those located in isolated places, with difficult access or low population density, were clearly disadvantaged with respect to those in or near urban settlements. The first group includes most mountain salinas and some valley salinas without road access. Some isolated salinas such as La Inesperada in Guadalajara, Nuévalos in Zaragoza or Trillo in Huesca require a 30-minute cross-country walk in abrupt terrain. These sites feature not only well-developed salt making infrastructures but also needed storage space on the spot. The salt was hauled by mule back then. Logically these salinas were abandoned early; at the latest in the second half of the 20th century.

Other salinas have direct road access to the site and cargo vehicles can reach the storage buildings without much effort. Although they are not located within walking distance of urban areas, hauling the salt to the hinterland was not a main concern. This is the case of Espartinas, Imón, Rambla Salada, Peralta and Arcos. Paradoxically, the easy access by road and the relative closeness of the railroad (the latter is the case of Añana, Espartinas, Poza de la Sal, Gerri de la Sal or Imón) played a significant role in the decline of the salinas, as it also allowed easy access of other salts to these territories. A few salt making sites are located directly in urban settings, such as La Malahá, in Granada. In some cases, the salinas have always been near the dwellings, as occurs in Añana, Gerri de la Sal, Poza de la Sal or San Juan; in other cases, urban sprawl has reached the salina in later stages. In both situations, the salinas could manage with one (or several) storage buildings on the spot and did not need additional infrastructures in other locations, such as larger towns or transport hubs[31]. In these urban sites, access to the market was unhindered and direct.

State of the facilities

Given the immense number of salt making sites in Europe and their interest for conservation and sustainable (re-)use, it is also relevant to understand the situation in which this heritage is found. *Active* sites are those that are currently in function, with no immediate threat of closure. The salt making activity is healthy in socioeconomic terms and has a strong relation to its hinterland. This is the case of the European study sites (Guérande, Læsø and Sečovlje) as well as many others in Europe, including the industrial sites. Among the study sites in Spain, this would be the situation of Añana, Poza de la Sal, San Juan and Rambla Salada. In case the salt making activity halts for a reason, but there seems to be a certain degree of supervision or maintenance of the site, this would be considered as *stagnated* or *inactive*. Inactive sites can be reactivated at any time, without much structural intervention. This has actually been the situation of the above-mentioned study sites in Spain, which went through a period of stagnation. Other sites, such as Gerri de la Sal, are largely inactive now. It used to be the case of some other sites, such as Imón or Peralta, but the degree of deterioration is growing and may need to be downgraded to the next category. When no visible maintenance or supervision is done, but the facilities are still erect, the site is then considered *abandoned*. At this stage, recovery should still be possible without too much effort, although some renovation and upgrading would be necessary. As said, this would now be the situation in Imón and Peralta. Arcos de las Salinas has long been in this situation, too. In case the facilities

[31] The *Condominio de las Salinas de Imón y de La Olmeda* owned a large storage building next to the railroad tracks in front of the Sigüenza train station, with direct access to the road from Atienza to Sigüenza, from where the salt from both salinas was hauled. The impressive building is today in private hands, alas abandoned and consequently vandalised.

are not erect or need total reconstruction, then the site will be *ruined* and will need a considerable effort to recover. This is the situation of Espartinas. Once there are no visible traces other than archaeological remains or references in documents, the site is considered to have *disappeared*. Many sites in Europe are in this situation, as has been shown in Table 1.2.

Understanding the process by which one site moves from one category to the other, whether in upward or downward direction, allows to prevent situations of decline, draw lessons and obtain good practices from successful cases. This is therefore the main driver to study patrimonialization processes: to avoid the additional irreversible destruction of saltscapes and salt heritage.

3.4 Artisanal solar evaporation salinas

The functioning of a solar evaporation salina is based upon the principle of letting the brine or seawater flow from one basin to another, a process in which the brine becomes more concentrated as it advances within the system. These basins have a diversity of vernacular names, depending on the location. For the purpose of this text, I will refer to evaporators and concentrators as those basins that are needed to concentrate the brine/evaporate the water in successive stages and crystallizers to those basins in which the salt finally can be collected. Depending on the initial salinity of the water entering a salina, it will need to stay more or less time in it and rest in different basins. If the source of brine is seawater, it has an initial salinity of roughly 3-4%, and it will need to travel through three or four sets of basins before arriving at the crystallizers (see Figure 3.2), in which it should have reached around 25% salinity, almost saturated brine. Figure 3.2 shows a simplified model of a coastal salina, roughly based on those found in the estuaries near Aveiro and Figueira da Foz, in Portugal. In a typical inland salina, the sets of basins are usually just two, given the relatively high initial salinity of the brine. In that case, evaporators are mainly used to chemically precipitate other salts (carbonates, sulfates) and get rid of solid suspended in the brine by physical precipitation.

Each subset of basins consists of a virtually closed system in which energy and matter are exchanged internally. They each have their own trophic network and ecosystem, which hardly mixes with that of adjacent basins. These become smaller and shallower as the salinity of the brine increases. The flow from one set of basins to the next is regulated by the salt makers themselves, once they observe it has reached the right salinity and quality. In the last stage, the crystallizers, the brine should not cover "one's toe" (Valentín Agulo, president of Gatzagak S.L., pers. comm.), which allows to optimise the period of residence in the basin and be able to harvest the salt within a reasonable time.

Salt makers move the brine within the basin with precise movements, speed and rythm, and using specific tools, so as to obtain the kind of crystals they wish. This needs a careful observation of weather conditions, both during the day as by night (wind, humidity, daytime temperature, insolation, temperature drop at night, etc.) and adjusting to them. It is said that the crystallisation of salt does not depend so much on temperature as such but on the sudden drop of it when the sun sets. Evening is thus the ideal time for the forming of the crystals. This requires an important know-how and a capacity to react to the local circumstances, difficult to emulate by automated processes.

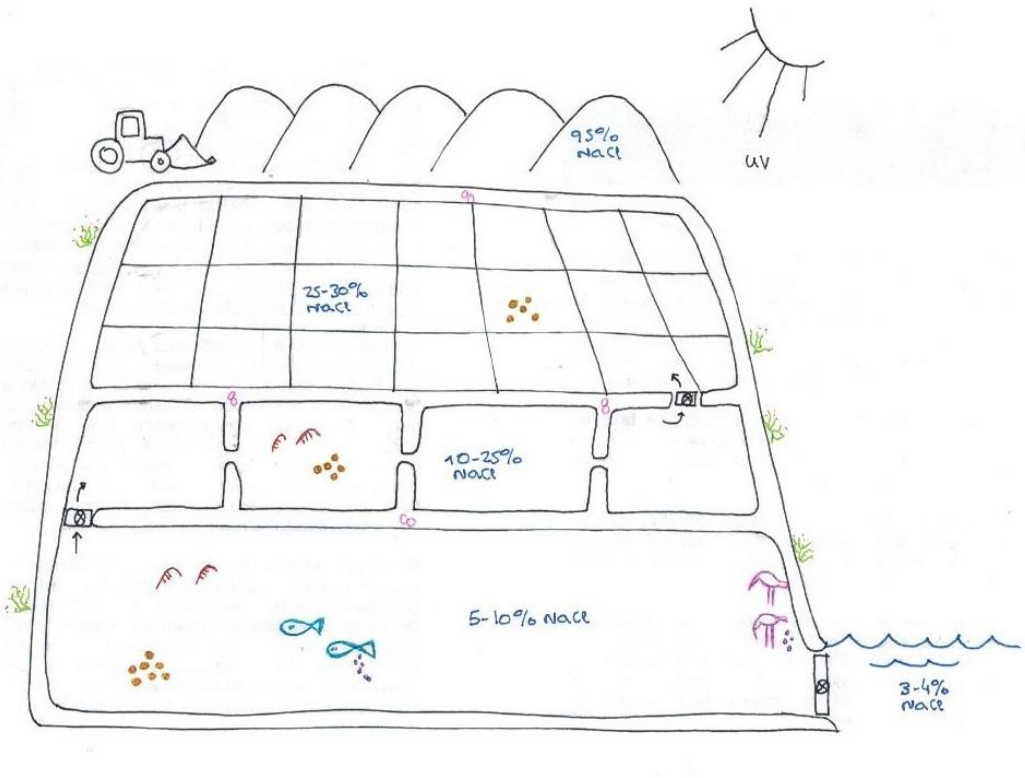


Figure 3.2: Simplified sketch of a coastal solar evaporation salina, with the increasing concentrations of NaCl as the brine flows (Source: Own elaboration)

3.4.1 The case of inland salinas

Inland salinas, i.e. solar evaporation salinas that are found away from the sea have been defined as those "saltscapes dominated by solar evaporation salt making sites fed by evaporitic brine sources" (Hueso & Carrasco 2008a). This type of saltscape, inland salinas, is a typical Iberian phenomenon and even endemic, when considered at European scale (see Chapter 1). To cite an example, Romania has hundreds of registered brine sources in the Carpathian and extra-Carpathian region (Olivier Weller, CNRS, pers. comm.), but not a single solar evaporation salt making site has been found there. Inland solar evaporation salinas do exist in many other regions of the world, but certainly in a lower degree of abundance or concentration, whereas a small region as Spain, hosts remains of over 500 solar evaporation salt making sites (Carrasco & Hueso 2008a). Given their rarity and fragility (as will be discussed later), special attention will be given to Iberian inland salinas in this thesis.

Most of these saltscapes originate from the old Tethys sea, that roughly covered the eastern half of the Iberian Peninsula 200 million years ago, during the Triassic period (Figure 3.3a) (Comín & Alonso 1988, Montes & Martino 1987). This sea (re-)inundated and evaporated certain areas periodically, accumulating large evaporitic deposits in this region. Depending on latter geological events (such as tectonic and karstic movements), these deposits have become naturally accessible to humans, in the form of deposits, domes, diapirs, etc. (see Table 3.3). Other inland saltscapes originate from the Miocene period, which occurred much later (5-10 million years ago), but had a similar geological evolution. Yet others are of endorheic origin, such as most inland saline lakes (Comín & Alonso 1988, Montes & Martino 1987).

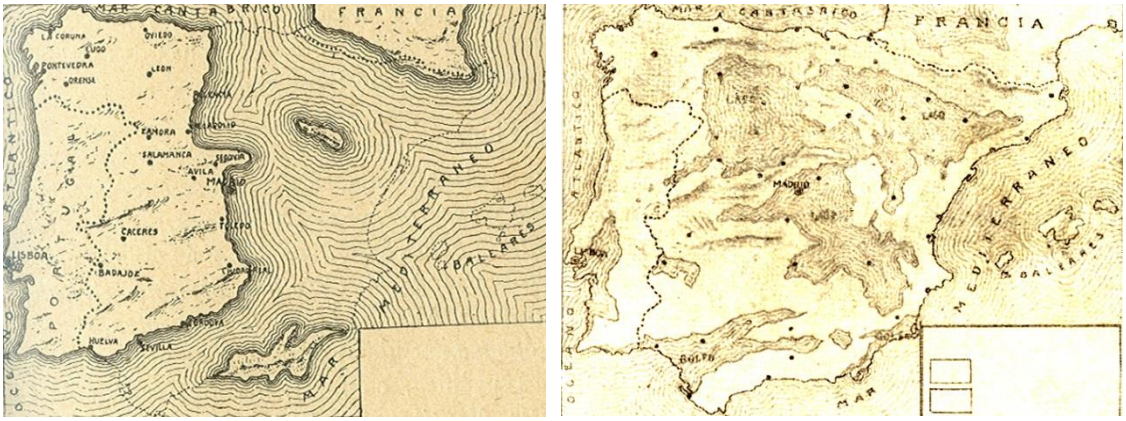


Figure 3.3: Map showing the Iberian Peninsula during the Triassic (a, left) and Miocene (b, right) periods (Source: Fábrega 1926)

The Iberian Peninsula hosts an invaluable diversity and abundance of inland salt making sites, which respond to local geomorphology, topography, available building materials and the vernacular know-how. These factors create unique combinations that merge at any given site, which may be considered unique in many ways. Of the ca 500 such sites that have existed, ess than 10% are in a state of conservation that would allow recovery (see above). Few comparative studies exist on the diversity of salt production techniques in inland salinas (Beltran 2007a, Carrasco & Hueso 2008a, Hueso 2015b, Plata 2006) and only such works have the capacity to raise awareness on the wealth of vernacular knowledge (work processes, technical vocabulary, calendar of activities), historical and cultural diversity associated to this activity. Other works cover regional overviews, such as Valencia (Iranzo 2005), Murcia (Pozo 1992) or Guadalajara (Carrasco & Hueso 2006b, Hueso & Carrasco 2008b, López Gómez 1970). The salinas of Andalusia -including both coastal and inland sites- have been well documented in several works (Pérez Hurtado de Mendoza 2004, Román 2014). Other reference works that describe the salt making process in detail are found for the study sites Salinas de Añana (Torres 1991), Gerri de la Sal (Beltran 1990, 1993), Imón (Trallero *et al.* 2003a, 2003b), Peralta de la Sal (Fuster & Tomás 2008) and Poza de la Sal (Sáiz 1989). Elsewhere in Spain, descriptions are found of Cambrils in Lleida (Roca *et al.* 1989), Naval, in Huesca (Rodríguez 2015) or Pinilla, in Albacete (Carmona 2010).

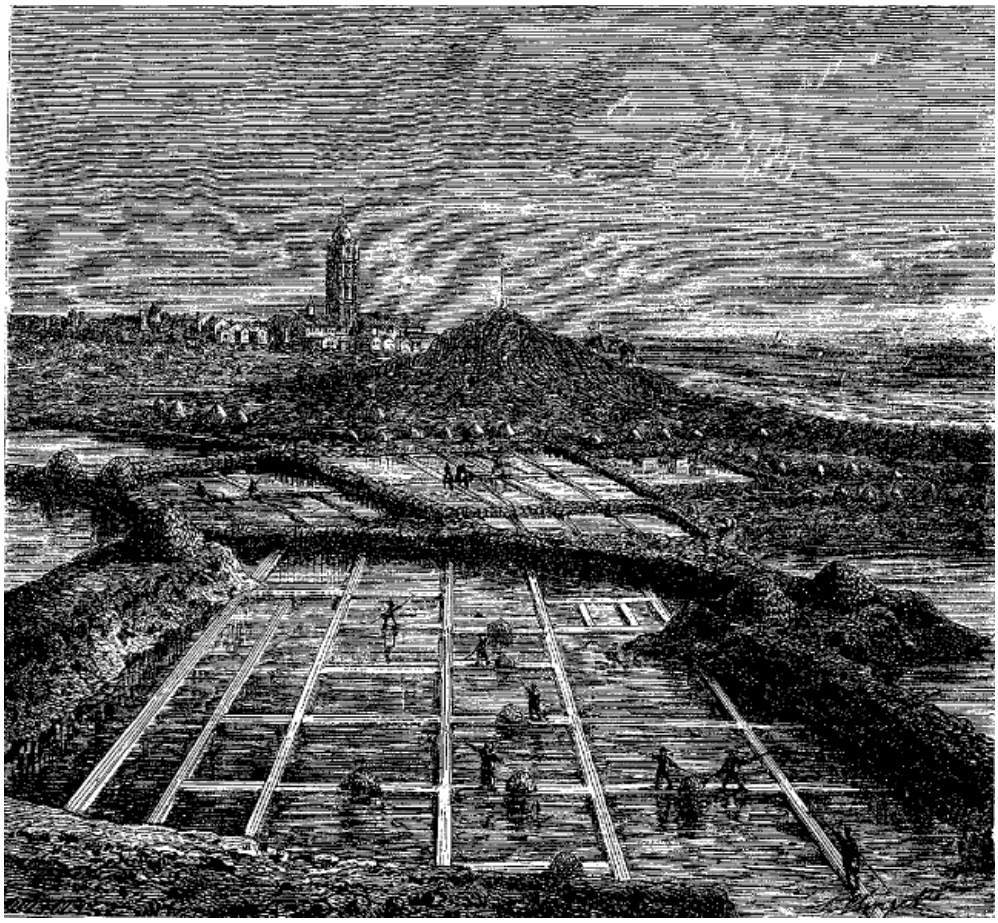
Besides from the huge cultural implications of being a unique form of salt production at continental scale, and the responsibility we have to preserve this heritage, inland salinas constitute "islands of water in a sea of land" (Paracuellos *et al.* 2006). This means they host natural values associated to the saline conditions of the site, that are separated from the rest of the surrounding habitat, just like islands are locked by (sea-)water. There is a very steep salinity gradient from the core of an inland salina to its edge, making natural exchange with populations in nearby locations, let alone other salinas, virtually impossible[32]. Besides from the genetic isolation of the populations of *halobiota (*i.e. living beings adapted to life in a saline environment), these are also very sensitive to environmental changes. Their physiological resources are suited for the survival under certain extreme conditions and are not so well prepared to support changes in these conditions. Shifts in temperature, water level, solar radiation or salinity, can mean the difference between a thriving population or its

[32] Aeolian transport of seeds and small insects is too local, to allow the transfer to distant wetlands with similar conditions, as they are located dozens or hundreds of kilometres away from each other. Transfer via migratory birds is probably the only option, as they will naturally seek stopover sites with similar features and can travel long distances.

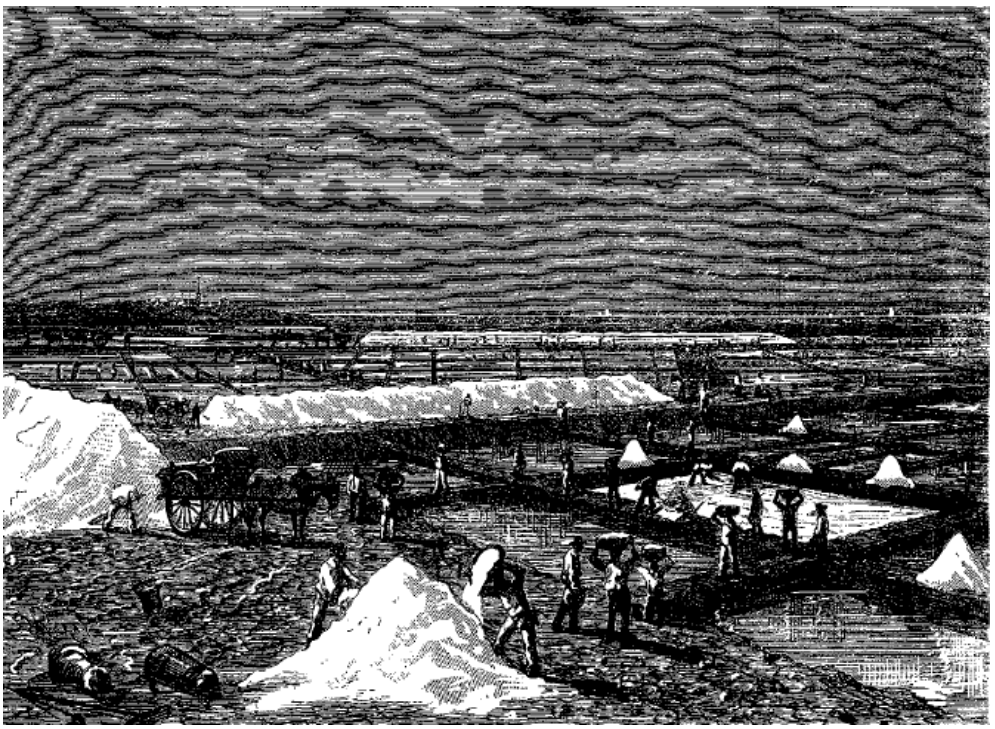
local extinction. Therefore, the abandonment of an inland salina not only affects the cultural and intangible values of the site, but also its natural values (Hueso 2012). The low visibility of inland saltscapes and their danger of disappearing make them especially worth attending to.

3.4.2 Atlantic vs Mediterranean-style salt making

From a geographical point of view, two main groups of solar evaporation salt making modes can be distinguished in Europe, namely Atlantic salt making and Mediterranean salt making, each with distinct features. Atlantic-style salt making (Figure 3.4a) relies on the natural force of the tides to let the seawater into the salina, which is usually built on clay ground that needs annual repair or even reconstruction. Due to more unstable climatic conditions in these regions, with higher air humidity, the crystallizers are fed by sprinkling brine to ensure rapid evaporation, and the salt is collected and stored as soon as possible. Harvest takes thus place at a continuous pace. The act of salt harvesting has a more artisanal character and therefore is more labour intensive (Hocquet *et al.* 2001, Petanidou 1997). Mediterranean-style salt making (Figure 3.4b) shows significant differences, due to the more stable climatic conditions and the smaller tidal amplitude. Therefore, the seawater needs to be pumped into the salina, as it usually cannot enter it by itself. To this end, different mechanical devices can be used (windmills, animal-driven pumps or electrical pumps). On the other hand, the crystallizers are fed by flooding them, and the brine is allowed to almost completely evaporate before harvesting the salt. Since the amount of brine to be evaporated is relatively large and this may take some time (usually several weeks), harvesting takes place at a discontinuous pace. Often a layer of salt is left on the ground, to act as an insulation layer and create a solid stone-like foundation, as well as to prevent contamination from soil particles. The ground is therefore more solid and allows the use of heavier machinery to harvest the salt, and the salina does not need yearly reconstruction. This allows to increase the production of salt with relatively less labour intensive methods (Petanidou 1997, Petanidou & Dalaka 2009, Rodrigues *et al.* 2011). Iberian inland salinas respond to a mixed Atlantic-Mediterranean model, and one or the other may prevail depending on the location, climate and area of cultural influence.



a. Example of a typical Atlantic salt making site in France (Figuier 1873-1877)



b. Example of a typical Mediterranean salt making site (Figuier 1873-1877)

Figure 3.4: Atlantic vs Mediterranean solar evaporation salt making

3.4.3 Industrial vs artisanal salt making

Another typical dichotomy arises form the point of view of scale of operation and management (see Table 3.3), two main categories may be distinguished: Industrial salt works and artisanal salinas. Industrial salt works are usually run by large companies, often linked to the mining sector, which can be translated in a more or less homogeneous, corporate-style commercial strategy. Expressed in colloquial terms, one may hypothesize that these companies are still thriving in the "salt business", whereas the latter are into the "business of heritage".

On the other hand, the management of artisanal salinas is very heterogeneous due to the different nature of the institutions that run them (from SMEs to NGOs, local authorities, individual salt makers and cooperatives or often a combination of these via land stewardship or similar agreements) (ISAL 2014, pers. obs.). Typically, the overall production of salt in industrial sites is five times higher than in artisanal sites, although variability in production figures is very high in both types of salinas (IGME 2011, ISAL 2014, as well as IPAISAL unpublished data). Of the total production, less than 4% of industrial salt is employed as culinary salt (ISAL 2014), but it is probably a very relevant segment due to the much higher profitability. No figures exist for the end market of artisanal salt but most producers seem to target the culinary segment (pers. obs.). However, pre-industrial salinas may have stayed artisanal forced by the drivers of the market and offer similar salts as industrial salts do, but without the benefit of scale. These salinas are very seldom found, only in isolated regions, and need to face the choice of becoming facultative artisanal, or to abandon the activity. Facultative artisanal sites have a clear niche, actively seeking a conceptual separation from the industrial salts market.

On the other hand, salt making sites, whatever their location or scale of production, have always been attractive locations for ecocultural tourism (Hueso & Petanidou 2011b), a reason why many of these sites are happy to welcome visitors and increase their income with this activity. The implementation of tourism services (guided visits, salt making experiences, spa and wellness, bird watching tours…) is much more widespread in artisanal sites than in industrial ones. Several reasons may explain this: the larger morphological diversity of artisanal salinas, the higher visibility of their associated natural, cultural and human values and the management priorities of the site's owners. The recent interest large industrial salt making companies show in preserving their natural and cultural heritage seems rather to respond to the strategic benefits of incorporating corporate social responsibility issues in their management (e.g. see the website of Groupe Salins, URL: www.salins.com). Table 3.4 presents the main differences between industrial and artisanal salinas in Europe.

Table 3.4: Some features of operating artisanal and industrial salinas in Spain

Scale	Industrial	Artisanal
Nr sites	23	25-30
Type of managing body	Corporate: (Producers Transformers Distributors)	SMEs NGOs Cooperatives Authorities Private owners
Open for tourism	ca. 15%	ca. 90%
Mean annual production	ca. 4,5 MT	ca. 0,5 MT
% for human consumption	4%	unknown - variable

Sources: Carrasco & Hueso (2008), IGME (2011), ISAL (2014); also IPAISAL unpub. data

3.4.4 A mining vs agricultural activity

Another important issue of debate among scholars is whether salt making is a mining (i.e industrial) or agricultural activity. Seen from the product point of view, salt is a mineral and hence, it must be *mined*. However, when we look at the process of salt making in solar evaporation salinas, it differs much from any conventional mining technique, even from those applied to the production of salt (quarrying, rock mining, room and pillars…). The production of solar salt need an adequate management of the seawater or the brine. The placement of a salina is not serendipitous, either. Salinas need a specific soil composition that ensures impermeability to avoid the loss of brine, but that at the same time stays wet to avoid cracks and leaks. The brine has to be, as if were, *sown* and *cultivated*, that is, moved from one basin to the other at the right time with the proper concentration of minerals at each basin. This only happens when the composition and biological communities in the basins are adequate for that stage of salt making (see below). There should be a balanced trophic network, with sufficient but not too many nutrients and salts, so that the brine has the right concentration at each stage of the process. Although these parameters can be measured with state-of-the-art equipment, it has traditionally been done by simply looking at the brine. This is a type of vernacular knowledge that had to be passed on from generation to generation and is very dependent on the environmental conditions of the site (Carrasco 2017).

The salt has thus to *grow* in the basins and finally crystallize to be *harvested*. Not only the actions of the salt makers, but the language they use stems from the agricultural activity. This also translated in the use of tools and devices more akin to agriculture than to modern mining (wheelbarrows, baskets, spades, rakes…). Another factor to consider in the management of solar salt making is the weather dependence, similar to that of crops (although, in this case, the situation is reversed, given that rain is less welcome). Traditionally, given the strong seasonality of solar evaporation salt making, salt workers were forced to combine their role as peasants who earned their living and the production of salt (Carrasco 2017).

Without losing the perspective of salt being a mineral, inorganic compound, the affinity to agriculture is most evident in artisanal salt making sites, regardless of their location (inland or coastal). Industrial salinas are more akin to intensive agriculture systems, in which heavy machinery is used, although a deep knowledge of water management is still needed. As a compromise, this consideration of "agricultural" activity has been acknowledged for hand-harvested salt in France or Portugal, but remains to be done elsewhere in Europe.

3.4.5 Contesting dichotomies

Having said this, the dichotomies of salt making (inland vs, coastal; Atlantic vs Mediterranean, industrial vs artisanal, mining vs agricultural) described above are a rough generalisation of the reality found in Europe. Many salt making sites present in fact mixed situations. Microclimate is for instance an important factor determining the choice of salt making method. Hence, sites in the Algarve region, despite facing the Atlantic, have a Mediterranean climate and can show mixed features between the two regional styles. Soil can also be determinant: Canarian salinas lie on volcanic rock and, although they are located in the Atlantic coast, the construction of their pans is very different than the prototype of Atlantic salinas described above. Another important factor is the microtopography of the coast. In absence of large, flat areas, some Mediterranean sites cannot develop further than small primitive, almost spontaneous, salt harvesting sites located in rocky hollows, such as those

found the Peloponnese, Malta or Croatia, and despite their favourable climate cannot be upscaled into large sites.

Another important factor is the structure of the property of the salina, which can be represented by one large management body –the usual case in industrial and semi-industrial sites– or rather have a horizontal management among salt makers, such as many of the Atlantic sites now organised in the form of cooperatives of salt makers (Luengo & Marín 1994, Petanidou 1997). Some of the smaller sites are directly managed by the owners –that is, the owners are actually producing the salt– whereas other owners prefer to hire workers to do the job. The owners may or not be settled in the area. When this onwnership scheme perdures in time, it is the heirs of the original owners who take care of the management, often with dwindling motivation and skill. This distinction (owners who are salt makers vs owners who hire salt makers) may result in a different outcome with respect to the survival of salt making sites. The issue of ownership will be discussed in more depth in Chapter 8.

3.5 The heritage values of saltscapes

3.5.1 Is the such a thing as saltscapes?

The definition of saltscapes shown above is definition is vague enough to include almost any type of saline habitat, regardless of salinity, seasonality or origin of the salt, in addition to those cultural landscape types that exist as a consequence of the production of salt as a commodity. Furthermore, saltscapes can be in fact "created" by the human action, when the salt is sufficiently hidden under natural conditions, but appears to the surface during its exploitation as a commodity. Saltscapes can be classified under different criteria, such as the origin of the salt in the landscape, the degree of salinity in water or soil, the geomorphology of the terrain or the degree of human activity in the area.

The most relevant factor in the shaping of saltscapes, whether manmade or not, is how the salt is present in it. The natural occurrence of salt constitutes the cryptosystem of a saltscape and defines how the phenosystem will be (González Bernáldez 1981). From a physicochemical point of view, under normal conditions for temperature and pressure, common salt or sodium chloride is a solid, regular cubic crystal. However, given the high solubility of salt, it can be often be found dissolved in water[33]. In nature, salt above the ground is usually present in dissolved form, as water from precipitation and runoff contacts the (sub-)surface layer of salt and dissolves it. Brine can be found in many forms in nature, such as natural springs, hypersaline streams, salt marshes, salt or saline lakes, etc. In the underground, salt appears either as a solid rock, diapirs or in dissolved form, in underground phreatic layers (see also Table 3.2).

The salinity of the soil or the water will determine the structure and species composition of the habitat, and hence will shape the phenosystem. Salinity will affect the presence and abundance of halophyllic (i.e. salt loving) species of fauna and flora and the degree of

[33] The concentration of salt in water determines the name that is used for the solution (Gorrell 1958). *Freshwater* can hold up to 0,1% of dissolved salts; *brackish water* up to 1% (three times less than the concentration found in seawater), *saline water* up to 10% (typically found in saline lakes) and *brine*, above 10% of salt, most common in solar evaporation facilities and hypersaline lakes. From a concentration of 25% onwards, salt starts to precipitate.

specialization of these species (from those so-called halotolerant that can thrive both under non-saline and low saline conditions, to the so-called extreme halophiles, which require high salinities). If the site has high salinity in general, most generalist species –usually bigger and more conspicuous– will not be able to thrive. Since most halophiles are small and most extreme halophiles are microorganisms, the landscape will appear empty, almost devoid of life. Nothing farther from the truth. Under saline conditions, the diversity of species may decrease but the abundance of specialized halophiles, in absence of predators and competitors, may soar (Godet *et al*. 2016, Hueso 2012).

The geomorphology of the terrain is not directly related to the presence of salt but will determine how species colonize it and how easy or not it will be to obtain salt in the area. Hence, saltscapes can be flat, as is usually the case with coastal solar evaporation salinas, but also in some inland sites. They can also be found in more or less steep hills, in deep valleys, on floodplains… as is often the case in inland salinas in Europe; see Emilia Román's doctoral dissertation for a characterization of Andalusian saltscapes (2014)[34]. Occasionally, they are also found on the cliffs by the sea, as has been explained above; on high mountain plateaus, such as the salt lakes of the High Andes, Tibet or even Antarctica, etc. Saltscapes can therefore be found in virtually every biome: from rain forest and mangrove ecosystems to polar and high alpine habitats; from temperate forests to steppes and deserts (Petanidou 1997, Williams 1981). What determines the existence of a saltscape is salt, whether naturally present or aided by the action of man.

3.5.2 Biological values of natural and manmade saltscapes

As defined above, salt is the key element around which saltscapes are shaped. How salt is present in nature has been discussed in the previous section. Here the focus will be on how this salt affects the habitat, the species that colonise it and their trophic relations, i.e. the ecosystem as a whole.

It is a well-known fact that excess salt is a life-threatening condition for most living beings. Under natural conditions, the biota (i.e. living beings) native of saltscapes have developed different physiological mechanisms to cope with it. Some plants secrete salt from their aerial structures: Stem-succulents (those that accumulate salt in the stems), such as the genus *Salicornia*, and leaf-succulents (those that accumulate salt in the leaves), such as the genuses *Suaeda* or *Salsola*. Other plants recrete excess salt), such as the genuses *Limonium*, *Atriplex* or *Tamarix* and others confine it in extracellular organs such as vacuoles. Yet others dissolve it in their cells by becoming succulent or protect their organs from salinity with certain substances, such as glycol, a widely used anti-freeze alcohol (Breckle 2002). Similar mechanisms are used by microorganisms and small invertebrates. Larger animals are uncommon in hypersaline habitats. The physiological cost of developing and maintaining these mechanisms is high and few species are capable of doing so, thereby losing capacity of competing with other species under non-saline conditions. Therefore, the richness and abundance of species usually decreases with salinity (e.g. Gómez *et al.* 2005, Millán *et al.*

[34] Emilia Román (2014, 2015) distinguishes several landscape types in which Andalusian salinas can be found: Highland plateaux, steppes and subdeserts; agricultural fields; mountains; valleys, fertile flatlands and marshes; Mediterranean and Atlantic coastal salinas; urban and periurban areas. Although these types are defined with the Andalusian geographical context in mind and may overlap with each other, they constitute an excellent foundation for a possible future characterization of European saltscapes.

2002, Moreno *et al*. 1997). Halophiles are thus considered rare and fragile beings, especially those found inland, in isolated plots of saline ground surrounded by non-saline habitats.

Solar evaporation salinas are a specific type of saltscape in which humans have control over the presence of salt, by regulating its flow into the different elements present in it and therefore shaping the saline ecosystem. In them, there is a succession of basins of gradually increasing salinity, thereby creating a series of microhabitats of different salt concentrations, each with its own species composition and trophic network. These salinas are very stable environments, as each pond is considered to be at equilibrium and the biota consists of a well-adapted and established community (Dyall-Smith *et al.* 2003, Pedrós-Alió *et al.* 2000). These sites have a strong salinity gradient: from around 3%, which corresponds to the concentration of seawater; to 30%, which corresponds to the saturation level of salt in brine (see Figure 3.2). They show a significant drop in biodiversity when a salinity level of 7-15% is reached (Antón *et al*. 2000, Britton & Johnson 1987, Oren 1994, 2002, Pedrós-Alió *et al*. 2000, Rodrigues *et al*. 2011). On the other hand, inland saltworks are usually fed by brine springs or sources, with a salt concentration well above this level. In these inland sites, all ponds are thus considered hypersaline habitats. Hence, the diversity of their biota is relatively low, but, its rarity and fragility very high (Abellán *et al*. 2005, Gómez *et al*. 2005, Hueso & Carrasco 2009c, Masero *et al.* 2003). The main threat is the reduction of the saline conditions, which may increase the abundance and richness of generalist or opportunist species, but decrease the richness or abundance of the most halophyllic species, risking an overall biodiversity reduction at a regional level (Velasco *et al.* 2006).

The biota found in manmade salinas is essential to the salt production process, which is intimately linked to the system's physicochemical phenomena (Davis 1980, 2006). It is composed mainly of microscopic organisms suspended in the water (the planktonic community) and those attached to floor of the ponds (benthic communities forming the so-called microbial mats), which may aid or harm the salt production, depending on how they are managed (Davis 2006). Knowledge of the ecology of these communities is of utmost importance for salt production: a "balanced" biological system in salt ponds increases salt production both in qualitative as in quantitative terms, whereas an "inadequate" or "unbalanced" system prevents the adequate formation of crystals and salt precipitation (Davis 1980, Sundaresan *et al*. 2006). A system is balanced when the trophic community is stable and does not suffer from important changes over time. In a balanced salina, primary producers (algae, phytoplankton, microorganisms) are abundant enough to feed predators (from zooplankton to birds), which in turn provide organic matter to the system, as a result of defecation or decay. An unbalanced system can have several problems, the most typical being an excess of organic matter. This would make the brine turbid and prevent the formation of good quality crystals. Also, the planktonic community darkens the brine and increases solar energy absorption and water evaporation (Antón *et al*. 2002, Davis 1974, Javor 1989, 2002; Moosvi 2006, Oren 1999, 2005; Oren & Dubinsky 1994, Oren & Rodríguez-Valera 2001, Oren *et al.* 1992), thereby accelerating crystallization rate and increasing the production of salt. The benthic community retains nutrients from the overlying water, seals the ponds against brine leakage and fresh groundwater infiltration, and prevents excess mucilage production, facilitating the production of high quality salt crystals (Davis 2006, 2009). In order to keep the system balanced, a proper understanding is needed of the natural cycles of the species that form part of the various ecosystems (i.e. the different ponds) of the salina. The importance of a balanced trophic system for salt production should therefore not be underestimated.

Hence, salt production has become a completely integrated part of manmade saline ecosystems. Solar evaporation salinas can be considered as particular ecosystems, where

human intervention is not only tolerated but necessary to effectively produce an economically viable product while serving a critical role in nature conservation and biodiversity (Hueso & Carrasco 2008c, Korovessis & Lekkas 1999, MultiAveiro 2007, Petanidou 2000, Petanidou & Dalaka 2009).

3.5.3 The cultural relevance of saltscapes

The human presence is hence a very relevant factor when it comes to the definition of saltscapes, because we have the power to transform, enlarge or even create them, provided the relative abundance and proximity of naturally occurring salt. If salt is being exploited as a mineral resource, the production technique will determine the external features of a saltscape, its phenosystem. Several factors have influenced accessibility to salt, some of which were more efficient than others in terms of effort and energy input. The unique combination of natural and cultural factors, with the addition of elements to the landscape (buildings, infrastructures, roads…), leaves unique traces on the landscape and enriches the diversity of saltscapes that are found worldwide. Indeed, no two saltscapes are alike (Réault-Mille 2006).

On the other hand, as has been said previously, salt is much more than just a mineral: because of its many uses and applications. It has been a commodity of utmost strategic importance (Hueso & Petanidou 2011a). Not only essential for our survival, from a physiological point of view (Denton 1982, Schulkin 1991), but also for allowing the settlement in larger communities and even improving our ability to conquer new territories, thanks to its food preservative properties (Kaufmann 1960, Multhauf 1978). There is a mutual relationship between the natural occurrence of salt and the human need for it. Salt making has shaped history in many ways at the local, but also at the global level. It has been the driver of historical events and its quest has shaped saltscapes, as shall be seen.

The ownership or right of use of salt production facilities was an ambition of the powerful classes, and many conflicts resulted from this. Just as is done today with oil, taxes were levied on salt and its market price was therefore far above its real cost of production. The production of salt was heavily controlled and most European nations had a salt monopoly controlled by the Crown or –later on– the State. The distribution and trade of salt was taxed and differences in production and fiscal pressure between territories resulted in smuggling attempts. Often, the governments would force individuals to purchase certain amounts of salt, whether they needed it or not, and there was no freedom to choose the type or origin of the salt. This obligation put some additional pressure on the micro-economies of local communities, and have been the trigger of the final decline of many smaller salt making sites. All this had enormous implications for the economic, trade and political relations of the world's ruling powers at different times in History. As an example, the uneven taxation of salt in the different regions of France in the seventeenth century was one of the consequences of the huge social and economic inequalities that eventually led to the French Revolution (de Person 1999, Hocquet 1985, Hueso & Petanidou 2011a, Multhauf 1978, Petanidou 1997).

The production, storage and trade of salt has also defined shipping routes and given rise to important ports, such as those in the Hanseatic League. In the case of inland salt, it created drovers' roads –considered in some cases the precursors of today's highways– and market towns in the middle of arid steppe areas, where salt was exchanged for agricultural and other farm produce. Historically this had implications for economies at every level. Many historical

towns and cities owe their rich heritage (buildings, art, wealth) to salt, Venice or Salzburg being famous examples (Hocquet 1982, Ritz 1996).

Historical salt making has left unique and often fragile marks on the landscape. There is scientific evidence of salt production around 5,000 B.C. and salt production methods have historically adapted to the climatic, topographic, geological and technological circumstances of each site (e.g. Harding 2013, Kepecs 2004, Weller & Dumitroaia 2005, Yoshida 1993). This phenomenon still happens today, although perhaps at a different scale. The substrate upon which the pools and other structures lie, is usually built from materials found on site. The construction of trackways, channels and dykes is subtly complex, requiring technical knowledge and experience. When left abandoned, these structures decay quickly and rapidly blend again with the surroundings. Important visible landmarks in these saltscapes include the buildings used to store and process salt and to house the salt makers. Most of these buildings have been erected according to local standards, and they are often very large and sturdy, which make them stand out in the usually flat landscape. Storage buildings are usually large and sometimes rather tall, necessitating buttresses to sustain their weight even when empty. From the architectural point of view, these salt warehouses were the precursors of certain types of industrial buildings. Salters' houses, on the other hand, many of which still stand in the vastness of the surrounding saltscape, were modest in many ways, being simply designed for temporary living for the summer and equipped basically using local materials. Other interesting constructions include the structures built to protect the waterwheels that pumped the brine to the surface from the harsh winter climate in several inland salinas in central Spain (e.g. Imón, La Olmeda, Rienda, Medinaceli and Armallá). Other structures usually to be found near salinas –such as guard houses, fortresses, and surveillance towers– reflect the power struggles which arose from the salt trade. Also, a large number of monasteries, churches or even cathedrals are known to have been involved in the local salt business (Petanidou 1997). In the cathedral of Sigüenza (Castilla-La Mancha, Spain), for instance, there is a plaque describing the use of salt sale profits as a payment for religious favours (pers. obs.).

3.5.4 The intangible values of saltscapes

Saltscapes are associated with a wide variety of values that may justify their conservation. As has been seen, salinas offer a rich material heritage in the form of infrastructures, buildings, devices and tools. Yet they are also the cradle of a vast intangible heritage composed of traditions, beliefs, language and art (Cultural and Technological Foundation of ETBA 2001, Hueso & Petanidou 2011a, Petanidou 1997, Viñals 2002). Among the most relevant intangible values, are the professional know how of the salt makers with respect to the building of the salt making site, the salt making technique or the understanding of natural processes and meteorology. Also, very relevant is the management of the work tasks and the distribution of water rights –such as found in Salinas de Añana, Spain, a 900-year old system of brine distribution (Valentín Angulo, ers. comm.), etc. Numerous authors have studied the ethnology of salt making in Europe, registering the functions and tasks to be performed in the salt making activity or even the wealth of lexicological terms, often site-specific (Beltran 1988a, 1990, 1991, 2007; Carmona 2010, Carrasco & Hueso 2006a, Fuster & Tomás 2008, González Navarro 1996, Hocquet & Hocquet 1974, Lemonnier 1980, 1984; Manuguerra 2013, Prado 1992, Rivero *et al.* 2015, Sáiz 1989, Tardy 1987, Torres 1991, Žagar 1995a, Zudič Antonič 2005).

The variety of uses and applications of salt are also imprinted in our cultural legacy. From the gastronomic point of view, many recipes –such as the classic fish baked in a crust of salt– use salt or brine as a basic ingredient. As a food preservative, salt allowed the storage of and trade in perishable foodstuffs such as meat, fish and vegetables, which would otherwise be inedible within a few days of production, permitting a highly enriching gastronomic cultural exchange between different communities down the centuries (Gallart *et al*. 2004). In fact, many dishes require a specific type of salt (fine or coarse-grained, *fleur de sel*, inland or sea salt, etc.) for best results. Salt makers from different geographical areas are capable of discerning the taste of their own salt compared to others (pers. obs.) and are well aware of the food items it combines best with.

Saltscapes are also a powerful source of inspiration for material and intellectual creativity. From modest ceramic salt cellars to renowned paintings, artists and craftsmen have used references to salt in their work. Salt has inspired musical compositions and music-making: to be "salty" is an essential condition for good Flamenco musicians. It has inspired writers and poets: the poems "Salinero" by Rafael Alberti and "Oda a la Sal" by Pablo Neruda are well-known (see Chapter 7 for more details). These landscapes are usually open, free and wild; remote and yet accessible; quiet but full of life: places so basic, pristine and primitive in some ways that they cannot fail to excite an emotional response from the viewer. Their sheer contemplation is one of its most important values.

Due to certain properties, such as antiseptic of preservative, salt has had important symbolic implications in different cultures. The symbolic values of salt are very deeply rooted in human societies, and references to salt are frequent in the holy texts of major religions (Latham 1982, Oren 2013, Sotodosos 2012). These symbolic values have also been depicted in classical painting. The "Last Supper" by Leonardo da Vinci shows the tipped salt cellar that symbolises bad luck in western cultures (Bisaccia 1997). Salt is often used in pagan funeral rituals, as a representation of eternal life and to symbolically preserve the corpse (Cruz 2008) as well as many other uses in daily life. These applications, whether practical or ritual, are more often found in the countryside all over Europe (Charro 1998, Moinier & Drüecke 2008, Sandu *et al*. 2010). Many other myths and legends exist around salt, and is often used in which craft and similar rituals (MacGregor & de Wardener 1998).

Salt is present in most languages in straightforward vocabulary (such as salad, salary, salami, sauce), as well as in idioms (to take something with a pinch of salt, to eat someone's salt, to share the salt and the beans). Salt toponymy is found everywhere, with place names deriving from the Greek "álas" (Hallein, Halle, Hallstatt), the Latin "sale" (Salinas, Salsomaggiore, Salzburg), the Turkish "tuz" (Tuzla, Tuz Gölü) and the Arabic "al-melah" (Armallá, La Malahá) Hundreds of toponyms have been found in Andalusia or the Ebro valley alone (Alberto & Sancho 1986, Hueso & Petanidou 2011a, Román 2014).

3.6 The patrimonialization of salt heritage

3.6.1 The decline of salt making and its consequences at landscape level

The abandonment of salt making in Spain and probably elsewhere in Europe responds to a combination of social, environmental and, above all, economic factors. Most salinas have been gradually abandoned during the 20th century. Of the thousands of salt making sites found in Europe in Mediaeval and Modern times, only a few dozens survived the industrialisation process during the late 18th and 19th centuries, while others, more isolated,

continued producing salt by artisanal methods, producing a double gap among them: on the one hand, industrialised sites enlarged their production numbers and on the other, required less manpower to do so. Since artisanal salt was not especially appreciated at the turn of the 20th century, those salinas survived only in isolated areas, where there was no other source of salt. A few decades later, the generalised use of domestic refrigerators forced a decrease in the use of salt in households.

New industrial uses were found for salt and its subcomponents, sodium and chlorine, which required a high degree of purity of the salt and therefore needed more mechanised production processes. These used also needed large quantities, which could be provided from industrial-scale salt making sites only. By that time, road networks had improved and industrial salt could be hauled virtually everywhere, giving artisanal salt the final death sentence. From the social point of view, the abandonment of traditional activities and the intense rural exodus suffered in Spain and elsewhere in Europe in the mid-20th century, was especially blatant in inland sites. This significantly contributed to the loss of the salt making activity in isolated areas, already in decline due to loss of profitability. For those who stayed, salt making was a seasonal activity incompatible with other rural activities, as the period of peak labour coincided (harvests, cattle raising…). It is also a physically demanding activity, under harsh conditions such as long working days, scorching heat, blinding whiteness and the need to handle sharp crystals. As with other agricultural activities, solar salt making is totally dependent on the weather conditions and an untimely thunderstorm may destroy a year's worth of work. With the shrinking prices of salt in the market, thanks to the penetration of cheaper industrial salt, the abandonment of the activity seems a logical consequence, also from the social and environmental points of view.

The previously abundant coastal salt making sites in the Mediterranean and slighly less in the Atlantic, have also dwindled over time. Only those with a better capacity to escalate from artisanal to industrial size survived, in some cases concentrating separated sites into one. The others were abandoned and subject to land use chages, such as aquaculture farms (more often in the Atlantic shores of Spain and France) or were trasnformed into tourism development areas. Such flat, large areas found at seafront level were very attractive grounds for hotels and leisure facilities. This has been the fate of many Mediterranean saltworks. A few others, though, have been protected as natural areas and host large colonies of birds and other interesting flora and fauna.

3.6.2 Reasons for the recovery of saltscapes and salt heritage

As has been said throughout this work, saltscapes and salt heritage are not adeqautely acknowledged, nor by the scientific community, policy makers and the public. These landscapes are in decline and are threatened to disappear. Although these are relatively unknown landscapes, there are numerous reasons that justify their recovery beyond their sheer value of existence.

Why conservation

As has been mentioned before, saltscapes are valuable landscapes, from many points of view. Besides from ethical considerations on the pertinence of preserving a legacy that belongs to present and future generations, there is a simple practical consideration. A healthy, productive salina is easier to preserve that a "museum" salina, that needs to keep

its hydrological regime going artificially (Korovessis & Lekkas 1999, Margalef 1983). By preserving a salt making site in production by traditional methods, its heritage will automatically be preserved, because that is what it has been made for. Having said this, attention should be paid to how a salina is working now and how it worked in the past. There should be a deep understanding of the history of the site, the relationship between its elements in the past and the present and the consequences of the activity within and beyond the borders of the site. The general principle is that salt making should be maintained, but there should also be a consensus on how this activity should be maintained so that its legacy is respected. Within this context, even more important is to preserve the intangible heritage. Stones may remain in place, but people who have worked or lived near a salt making site do not. Its wealth of traditions, beliefs, work techniques, legends, etc., disappear when the last saltmaker has left (Viñals 2002). Working or not, their stories should be registered and understood.

Why education

Salt will naturally trigger the public's interest, as anyone can easily relate to such an everyday commodity. Saltscapes are excellent locations to communicate the importance of salt and relate it to virtually any discipline: History, archaeology, ethnology, religion, architecture, geography, economy, geology, biology, chemistry... Saltscapes offer unique on site opportunities for project-based education in any degree of depth and within any formal or informal educational scheme. Educational and interpretation programmes in salinas can thus be very varied, it is an issue that offers enough material to satisfy people with any range or degree of interests.

From the point of view of research, saltscapes remain virtually unexplored sites and scientists are still discovering new species of microorganisms thriving in them, on a regular basis. The applications of these microorganisms seem diverse and useful in many different fields (microelectronics, biotechnology, cosmetics, pharmaceuticals, biofuels…) (DasSarma *et al.* 2010, Galinski & Louis 2002, Galinski & Tindall 1992, Kanekar *et al*. 2012, Margesin & Schinner 2001, Margheri *et a*l. 1987, Oren 2002, Ventosa & Nieto 1995) and hence saltscapes are hotspots for applied scientists. They even offer a field of study for space scientists, who are nowadays interested in studying extremophiles (i.e. halophiles live in extreme, hypersaline environments, and therefore are considered extremophiles) (Mancinelli 2005). Especially interesting, in this sense, are "living" salinas, that is, sites that are still productive, as they offer first-hand research material that can be otherwise difficult to obtain.

Why local development

In the last decade hand-harvested unrefined salts have been recovering or even emerging as a new culinary product (Drake & Drake 2011). To a great extent, thanks to the support of public administrations and other funding efforts, artisanal salt making is on the rise again and hand-harvested salts are being ever more appreciated. Considerable merit is to be granted to EU-funded projects such as ALAS, SEL and ECOSAL Atlantis in this respect, which have facilitated the consolidation of this activity in large areas of the Mediterranean and Atlantic regions of Europe. These projects have contributed to the professionalization of the artisanal salt making activity, with training courses, publications, exchange of experiences and know-how, promotion and, not the least, infrastructure recovery of salt making sites. Daring entrepreneurs and young, motivated people with a desire to reattach to the land (or, rather,

to the wetland) but with modern ways of doing and thinking, are slowly reconquering abandoned or stagnated salinas and creating living landscapes with them.

This shift towards traditional salt was triggered by a strong opposition movement against urban tourism development in the seventies that threatened the salt marshes of Guérande in France with their loss. Artisanal salt started to be produced again, with a renovated pride for the traditional methods, and the area and its previously dismissed *sel gris* recovered from ostracism, having now achieved worldwide fame (Perraud 2002). In the wake of this *sel gris*, a large number of artisanal salts aspire today to obtain a similar commercial success. Within the context of the popularisation of gastronomy, a slower, more conscious lifestyle and a deeper sensitivity towards cultural landscapes and their natural products, it is clear that salt is becoming a new food item to be explored and exploited. Specific salt recipe books are being published (e.g. Aikman-Smith & Gregson 2009, Barzini & Fassone 2007, Bitterman 2013, Bonnaves-Aguillaume 2007, Gubler & Glynn 2010, Robert 2007), quality food stores specialised in salt are starting to open in places as far apart as Barcelona, Amsterdam and Seattle and some sites rely on well known chefs to promote their products, such as Salinas de Añana, in Álava (Spain). A recent reference guide of culinary salts published by Mark Bitterman (2010) includes over 200 such salts worldwide, some of which have been discussed by other authors earlier (Beltran 2008a, see also Hueso 2015c). But traditional (i.e. hand harvested) salt production is not only about being *gourmand*. It is the strongest driver for landscape protection and heritage recovery and it improves local livelihoods for a number of reasons (Hueso & Petanidou 2011a): In order to harvest salt by hand, the site should be overall functional from the points of view of infrastructures, devices, tools, buidings… but also know-how and expertise of its workers. Also, as was previously discussed, a delicate ecological balance is needed to produce salt, as the biota found in solar evaporation salinas is intimately linked to the physicochemical phenomena that take place in them (Davis 1980, 2006).

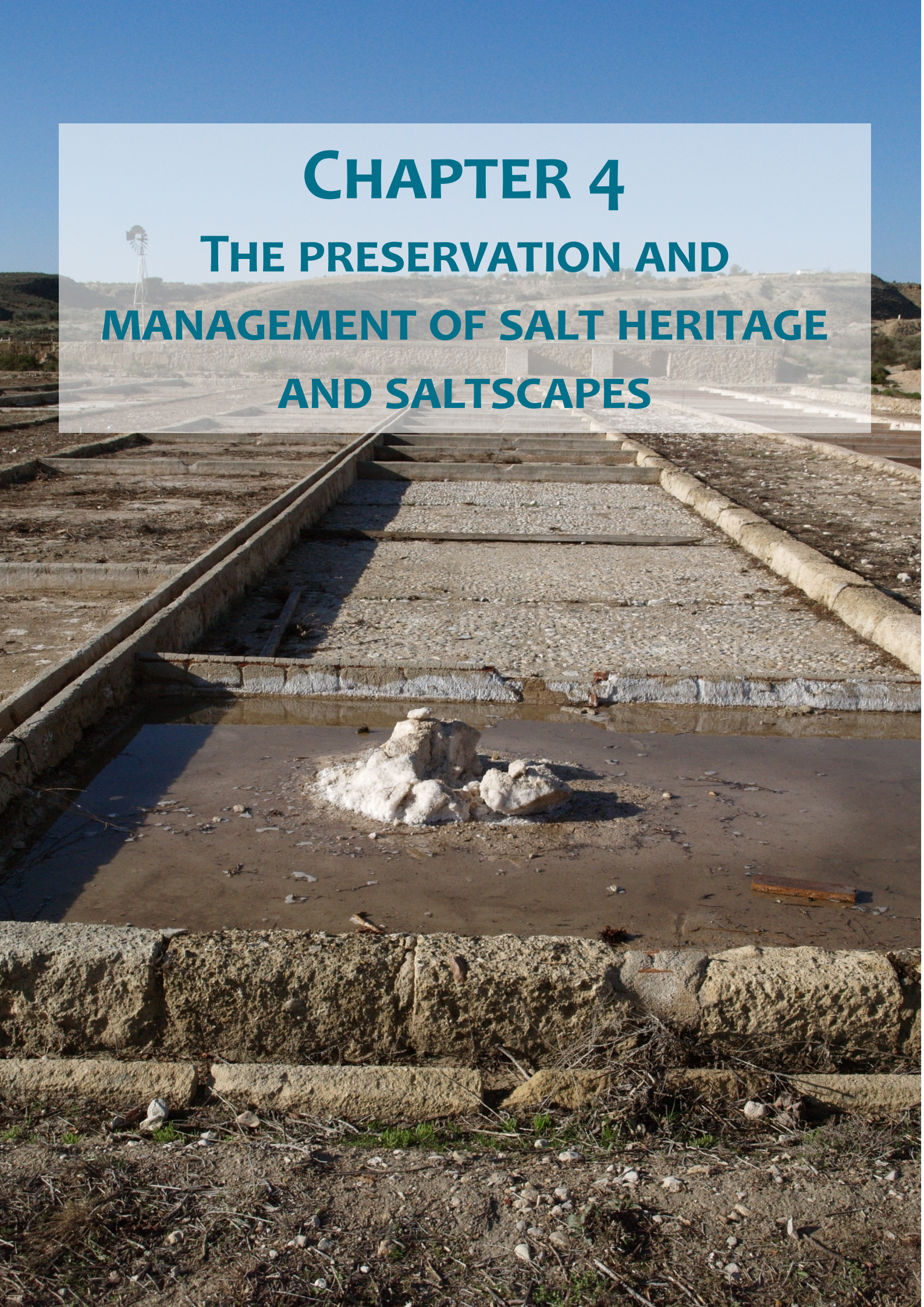
Harvesting by hand also requires intensive manual workforce, which requires a highly specialised training and expertise. Hand harvesting of salt has also become a tourist attraction in itself, whether visitors just witness it or also participate in it (pers. obs.) and the public who chooses to purchase this type of salt not only buy a quality food item, but also get themselves a piece of landscape and traditional know-how (Charles Perraud, former president of the Coopérative *Le Guérandais*, pers. comm.), with the added value that this entails. Traditional salt making is an excellent tool for the integrated and sustainable recovery of salinas (see also Beltran 2008a).

Saltscapes are also rich in biological by-products which have numerous applications. Plants growing in hypersaline soils can be eaten (such as *Salicornia europaea*) or transformed into cosmetics (*Salsola soda, Suaeda maritima*). The ever-present crustacean *Artemia sp*. is a popular food for aquarium fish, although large quantities are required to make this a profitable business. Perhaps most promising of all are the industrial and biotechnological applications of microalgae and hypersaline bacteria (see above) which are currently being developed. An environmentally conscious use of these resources can help maintain a salina's ecological balance by respecting the life cycles of the biota involved, and therefore preserving the ecosystem's values. An overall advantage of the multi-purpose production of salt and its by-products is the creation and maintenance of employment. A combination of traditional salt-making and high technology can guarantee the preservation of the intangible cultural heritage, while offering higher level jobs and providing a higher quality of life for employees and for those more indirectly associated with the process. Socio-economically, the recovery of a saltscape and its associated salt-making activity reinforces the identity of the site and its inhabitants' sense of belonging, thereby potentially strengthening its

attractiveness to visitors, policymakers, investors and other stakeholders. With a sound management plan, all these uses of salinas may be compatible with the preservation of their cultural heritage. Most importantly of all, their continued use will be sustainable from an economic, social and environmental point of view.

3.7 Conclusions

In this chapter I have analysed some aspects on the production of salt in artisanal salinas in relation to their landscape. The diverse physical-chemical properties of salt make it a unique mineral, that is essential for life. Not only for the survival or animals, but also for many other uses and applications, both in domestic as in industrial contexts. Some authors speak in fact of the "14,000 uses of salt". The term "sodium hunger" well describes the need of salt by humans, in a broad sense. Salt is an ubiquitous resource: it can be found in every continent, it is abundant to the point of inexhaustible and can be presented in many different forms in nature. The variety of landscapes and locations in which salt is found has also produced a huge diversity of techniques and methods to obtain it, at different scales and with different degrees of sophistication. The focus in this text is on solar evaporation salinas, the main type of salinas that will be discussed in the case studies. Especially relevant are inland solar evaporation sites, which are mainly found in the Iberian Peninsula, and can be considered an endemism at European scale. Solar evaporation salinas can be very diverse, too, although main categories can be distinguished according to different criteria: Atlantic vs Mediterranean salt making models, inland vs coastal salinas, industrial vs artisanal salt making, solar salt making as a mining vs agricultural activity. These somewhat simplistic dychotomies may contribute to understand the challenges and difficulties each site faces. Besides from the technical features of different salts and salt making sites, these landscapes host a wealth of natural and cultural values that truly form the basis of a specific cultural landscape type, namely saltscapes. These values are intimately related to each other as well as to the salt making activity itself. This relation is not only a spatial one, reflecting the influence natural processes can have on salt making and viceversa, or how salt making created new heritage values. It also has a temporal dimension, given the long lasting and deep relation humans have had with the production, distribution, trade and use of salt throughout History. This also includes the intangible values, derived from the strong symbolic values salt has in European culture. One of the main issues saltscapes face is the degree and the intensity of the decline they present at continental scale: In Europe, almost 90% of the historical salt making sites and their associated landscapes have disappeared, a figure that mounts up to 94% in the case of Iberian inland salinas. In order to preserve these saltscapes, these combined natural, cultural and intangible values need to be understood as an integrated and interdependent system. A few words are said about the reasons of the decline of salt making sites and the consequences at landscape level, as well as on their related heritage values. The reasons for the recovery of these landscapes are succinctly presented, both from the point of view of conservation and education as from the perspective of the opportunities for local development they may offer.



Chapter 4

The preservation and management of salt heritage and saltscapes

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4.1 Introduction

This chapter constitutes the transition between the state-of-the-art in the current situation of saltscapes and salt heritage in Europe and the specific situation of the study sites. Two main aspects are presented here: The protection and the management of salt-related values. To start with, the function and values of saltscapes and salt heritage are addressed. Given their vulnerability, as explained in previous chapters, the most common threats and challenges faced when trying to preserve their natural and cultural values are presented. To understand them, a framework of ecosystem services and values provided by saline wetlands is offered. As a consequence, the need to protect saltscapes and salt heritage and how this has been achieved so far by different protection and conservation measures is tackled. A distinction is made between legal protection instruments, agreements and networks found at international, European and national –for Spain– level, as well as indirect protection measures. The latter can be of different nature, such as voluntary agreements including land stewardship strategies or the inclusion in thematic networks and cultural/tourist routes. Also, different labels and certificates for salt as a product, whether voluntary or with external certification, are discussed (IGP/DPO, food labels, quality certificates, nature or environmental protection certificates, etc.). Another key aspect of the protection of salt-related heritage is management. The stakeholders involved in the management of salt heritage and saltscapes are identified and commented, and their role in this task is analysed, with some comments on participation processes in the management of saltscapes and in the study sites. The role of planning instruments in this management will be analysed, with special attention on natural protected area planning and master plans. Finally, different public and private funding instruments for the recovery and sound use of salt heritage and saltscapes are briefly commented. Special emphasis is given to European – funded transnational projects, in which some of the study sites have participated.

4.2 Functions and values of saltscapes

4.2.1 Ecosystem functions and values of saltscapes

As explained in Chapter 2, ecosystems offer a broad range of services deemed as useful to humans. Besides from the instrumental, direct use value of some of these services, others can only be aprreciated at larger time and space scales. Solar evaporation salinas are a specific type of ecosystem, namely wetlands, with complex features derived from the fact that they are on the fringe between water and land, and share features of both environments, plus the trophic relations that exist between them. Many authors have focused on the ecosystem services provided by wetlands (Borja *et al.* 2011, Finlayson *et al.* 2005, Russi *et al.* 2013, Skinner & Zalewski 1995, Viñals *et al.* 2011b). The services provided by ecosystems in general and wetlands in particular, can be classified in different function categories (Daniel *et al.* 2012, de Groot *et al.* 2002, Hein *et al.* 2006):

- *Provision functions*: natural and semi-natural ecosystems provide many commodities, ranging from oxygen, water, food, medicinal and genetic resources to sources of energy and materials for clothing and building. Part of these reosurces are of biotic origin (i.e. from living beings, and are, therefore, renewable) and others are abiotic (water, air, minerals…). Not all of these are renewable.

- *Regulation functions*: natural and semi-natural ecosystems have the capacity to regulate essential ecological processes and life support systems through bio-geochemical cycles and other biospheric processes. These functions provide many services that have direct and indirect benefits to humans.

- *Habitat functions*: natural ecosystems provide living space for all wild plant and animal species, both as a refuge and as reproduction habitat. They contribute to the conservation of biological and genetic diversity and evolutionary processes.

- *Cultural and amenity functions*: natural ecosystems provide an essential reference function and contribute to the maintenance of human health by providing opportunities for reflection, spiritual enrichment, cognitive development, recreation and aesthetic experiences.

Most of these services can also be provided specifically by salinas. The degree of relevance of each service will depend on both instrinsic (size, water quality, surrounding habitat…) and extrinsic factors (local needs for services), that can only be assessed individually. As an example, da Silva and his colleagues (da Silva *et al.* 2014) have identified a number of ecosystem services provided by coastal salinas worldwide, namely: recycling of nutrients in the water, retention of excess nutrients, habitat provision for estuarine fauna, refuge for migratory bird species, cultivation of microalgae and *Artemia* sp., water purification and, of course, the production of salt.

Whereas production, regulation and cultural services offer direct benefits to humans, habitat services are of direct value to wild species. Although the provision of all services depends on healthy ecosystems, humans assign value to them from a more or less instrumental perspective. As explained in Chapter 2, there are different set of values assigned to nature, according to the use humans will make of it. In Figure 4.1, the relationship between ecosystem services and values is shown.

As can be seen in Figure 4.1, each ecosystem service group serves two or more sets of values. There seems to be a mutual interdependence and a multipliciy of visions on how nature can be of use to humans. This is particularly the case with wetlands: They are "multiple-value ecosystems", which provide services both to individuals as to society as a whole and do so in perpetuity (Mitsch & Gosselink 1993, 2000). Hence, valuation of natural and seminatural ecosystems becomes a complex issue. The management of ecosystems in general, and more so of wetlands, requires a holistic and integrated vision, at a broad spatial and temporal scale. It should also be borne in mind that wetlands do not always comply with the economic law of scarcity, by which a commodity becomes more valuable as it becomes less available. This law does not apply to certain ecosystem services, that will not be provided for if the wetlands become too small or too scarce (Mitsch & Gosselink 1993, 2000). This is a real scenario for saline wetlands, as shall be seen.

Some studies have been able to assign actual monetary value to the ecosystem services provided by wetlands. Schuyt & Brander (2004) estimated the value of worldwide salt marshes, including salinas, with a total estimated surface of 6,758 thousand hectares, in 73,382 thousand US dollars per year for the year 2000 (equivalent to 10,8 USD/ha/yr). European saltmarshes, with a total estimated surface of 500 thousand hectares, were worth 12,051 thousand US dollars per year (equivalent to 24,10 USD/ha/yr, twice as much as the world average). The total value of the world's wetlands amounted to almost 3,500 billion US dollars per year, which corresponded to 0,01% of the global Gross Domestic Product, according to World Bank data (EEA 2010).

Table 4.1: Typology of ecosystem services

Functions	Main service types
Provision	Food (fish, game, plants) Freshwater (drinking, irrigation, cooling, groundwater recharge) Raw materials (fibre, timber, fuel, fodder, fertilizer) Minerals (salt, peat, ornamental rocks) Energy (biomass, hydroelectric power) Genetic resources (crop improvement, autochtonous species) Medicinal resources (biochemical compounds, test organisms) Ornamental resources (artisan work, plants and flowers, pets, fashion)
Regulation	Air quality (capturing dust, fine chemicals) Climate (carbon sequestration, effect of vegetation on rainfall) Moderation on extreme events (storm protection, flood prevention) Water flow and supply (drainage, irrigation and drought prevention) Waste treatment (water purification) Erosion control, shoreline and delta dynamics Soil retention and formation, nutrient regulation and recycling Pollination Biological control (seed dispersal, pest control)
Habitat	Refugium (suitable living space) Nursery (suitable reproduction habitat)
Cultural and amenity	Aesthetic Recreation and tourism Culture, art and design Spiritual experience and religious traditions Sense of place, cultural identity Cognitive development / information / education Scientific and local knowledge

Sources: Adapted from Constanza *et al.* 1997, de Groot *et al.* 2002, Finlayson *et al.* 2005, Kumar 2010 & Borja *et al.* 2011

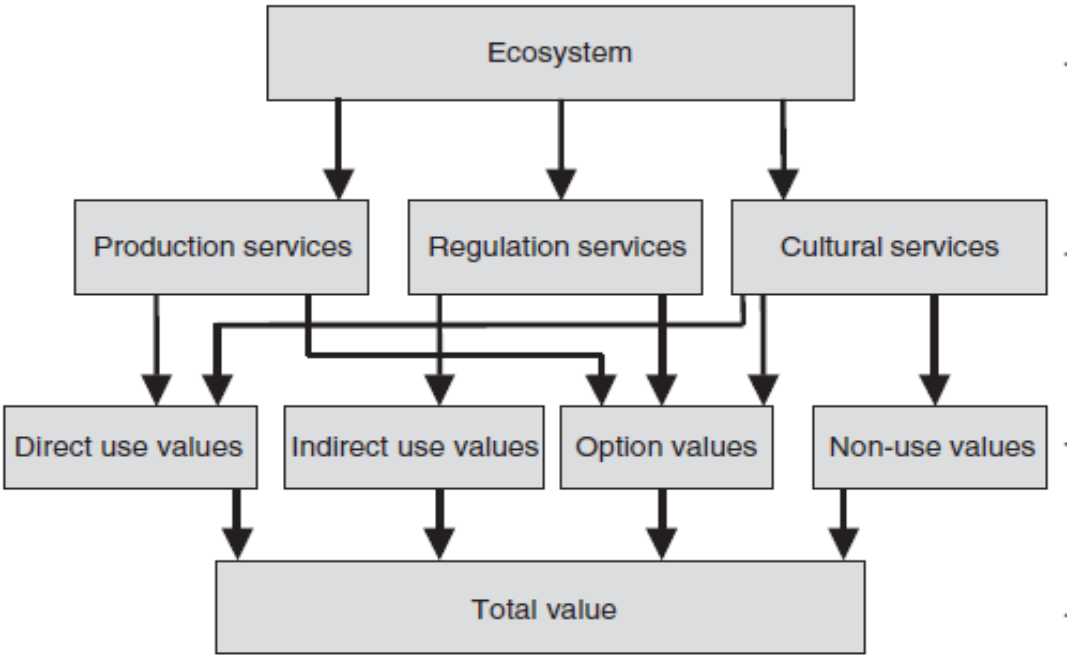


Figure 4.1: Relationship between ecosystem services and the types of values they represent (Source: adapted from Hein *et al.* 2006)

4.2.2 Current threats and challenges for the conservation of saltscapes and salt heritage

Despite their importance and values, saltscapes are being threatened globally, for a number of different reasons (overexploitation, pollution, drainage, overpopulation, eutrophication, agriculture intensification, alteration of ecological conditions, etc., see Table 4.2). Many of these actions are related to each other and create synergic effects: Since 1900, more than half of the world's wetlands have disappeared, thus also salt marshes (Barbier 1993, Casado & Montes 1991, 1995, Gedan *et al.* 2009, Pearce & Crivelli 1994, Schuyt & Brander 2004, Skinner & Zalewski 1995). Table 4.2 summarizes the main threats faced by wetlands, according to different types of ecological change: Alteration of the physical structure of the wetland, the quantity and quality of the water and the alterations in the biological communities they host. Although changes can be of natural origin or anthropogenic, this section will focus only on the latter. Alterations in the wetland can also affect ins cultural values, whether tangible (monuments, infrastructures, tools) as intangible (livelihoods, traditions, know-how…) (Viñals 2002).

Table 4.2: Possible causes of ecological change and wetland alteration

Ecological change	Possible causes
Alteration of the physical structure	- *Drainage and filling for urbanisation, tourism or industrial uses - *Transformation into agriculture or aquaculture - *Building infrastructures (roads, airports, etc.) - *Waste dumping - Modification of morphology (dykes, excavations, channels, etc.) - Mining and other extractive activities - Occupation of the basin
Alteration of the water quantity	- *Reservoirs: hydraulic energy, irrigation, filling, sediment retention, evaporation of the water in the reservoir - *Modification of the hydrological network and riverbed regulation - *Overexploitation of aquifers for irrigation, industry, human consumption - *Changes in ground use at watershed level: deforestation, erosion, filling - *Drainage and desiccation - *Filling, cleaning and fragmentation - Transfer of water between basins
Alteration of the water quality	- *Nutrient, pesticide and herbicide runoff - -*Salinization of surface and underground waters - *Changes in salinity and ionic composition - Dumping of wastewater - Industrial waste dumping - Waste from aquaculture and livestock breeding - Modification of the connection with the sea
Alteration of biological communities	- *Overhunting/Poaching - *Overgrazing - *Mechanic overexploitation of mineral resources - *Excessive recreational pressure - *Introduction of alien species - Destruction of riverine habitats - Overfishing and aquaculture

*Changes that especially affect saline wetlands, Source: Adapted from Hollis & Finlayson (1996)

In the case of saline wetlands, this loss has been reduced to 30%, mainly due to the conservation of large salt lakes such as Gallocanta and Fuentedepiedra. A larger percentage of smaller saline wetlands has disappeared (16%) or is highly altered (35%) (Casado & Montes 1991). One of them is La Janda lagoon, in southern Spain, the southernmost saline lake in Europe (Montes & Martino 1987). Another study indicates that the total surface of saline lakes in Spain has decreased from 6.743 ha in 1800 to 5.212 ha in 1990, a drop of almost 23% (Casado *et al*. 1992). Precise figures are difficult to obtain due to the ephemeral or temporary

character of these wetlands, the total surface may change dramatically from year to year (Hueso & Carrasco 2009a).

As shall be seen in the descriptions below, saltscapes in general and saline wetlands in particular suffer threats that are common to other wetlands in general, but others are specific to them. The main threats to wetlands can be classified in three main categories: Direct, indirect and natural causes (Dugan 1992). Direct causes refer to the alterations that target the wetland itself and have a direct consequence on its existence or quality. The most relevant direct causes are listed in Table 4.2, some of which are discussed below. Indirect causes, on the other hand, are alterations that usually affect at a broader spatial and/or temporal scale, but affect the wetland only indirectly. Natural causes are those not induced directly by man, such as droughts, floods, subsidence, extreme weather, biological invasions… etc. It remains to be seen, however, to what extent these events are indirectly anthropogenic or not. A word on this will be said in the climate change section below. In any case, whether the alterations can be afflicted on purpose or not is not relevant in this context. Here follow the most common causes of alterations and decline of saline wetlands.

Direct threats and challenges

Abandonment and land use change

The abandonment of saltscapes in Spain and, most probably, in the rest of Europe, coincides with the so called rural exodus that had its peak during the second half of the 20th century, but in fact has started decades before (see also Chapter 5). Traditional activities such as extensive agriculture, husbandry and handicrafts were quickly abandoned at the perspective of a better life in the then fast growing cities. This is also the case of traditional salinas. In this type of saltscapes, the abandonment of traditional salt making has had as a consequence the disappearance of valuable halophyllic communities, which are being replaced by generalist or opportunist plant species as soon as salinity decreases (e.g. Bouzillé *et al.* 2001, Tavares *et al*. 2009). In the case of coastal salinas, mechanization of operations and increase in the efficiency in the different salt making processes have resulted in the abandonment of small scale sites. In Greece, for example, the surface area of operating salt making sites has been cut by half in the last 50 years (Crisman *et al.* 2009; see also Petanidou & Dalaka 2009). As a result of these processes, saltscapes are abandoned and an uncontrolled ecological succession towards degradation follows (Carrasco & Hueso 2006c, Crisman *et al*. 2009, Hueso & Carrasco 2008c).

Similar effects can be expected with the transformation of the salt making activity into fish culture. Although the transformation of former salinas into aquaculture farms may be deemed a desirable alternative to sheer abandonment (Crisman *et al.* 2009, Yúfera & Arias 2010), the complex set of ecosystems found in the original structure of successive evaporation basins becomes one single, uniform ecosystem (Amat *et al*. 2007, Rodrigues *et al.* 2011). Similarly, bird communities seem to be sensitive to the landscape configuration of a salina, so land use changes in these landscapes may affect their salt species composition and distribution (Godet *et al*. 2016).

This loss in ecological quality directly affects the ecosystem and the flora and fauna that inhabit it. This is the case of flagship species such as greater flamingo *Phoenicopterus ruber* (Béchet *et al.* 2009) or less conspicuous ones, such as *Artemia* (Amat *et al*. 2007) or other invertebrates (Tavares *et al*. 2009). They are all losing habitat for refuge, foraging and nursery

functions. However, an adequate management plan for operating salinas or even their rehabilitation, has proven effective for the recovery of certain species. In Guérande, for example, bluethroats (*Luscinia svecica*) had all but disappeared with the transformation of former salt pans by pasture and crops in the 60s. Two decades later, with a renewed salt making activity, the bluethroats have returned to the area (Geslin *et al*. 2002).

Agriculture and irrigation runoff

In the second half of the 20th century, agriculture in Spain suffered an important transformation process. Due to the rural exodus mentioned above, a large surface of land used as agricultural fields was abandoned. However, other fields were transformed from extensive, low impact, to intensive practices, including comprehensive land reclamations and irrigation projects in large, arid areas (Casado & Montes 1991). One of the affected areas, the Monegros desert, located in one of the most important salt lake districts in north-eastern Spain, has ever since lost 50% of its wetlands and 30% of the remaining ones have been invaded by freshwater vegetation (Castañeda & Herrero 2007). Another associated effect of agricultural intensification is, depending on the quantity of water used, the eutrophication of saline wetlands or further salinization of water bodies and/or soil (Guerrero & de Wit 1992), which affects both natural as artificial saltscapes. This effect has been identified in the Natura 2000 site "Valle y salinas del Salado" in Guadalajara (Spain), which hosts up to a dozen former traditional salt making sites. Irrigation itself has in fact been proven as a threat factor for wetlands in arid areas, as its alters the delicate balance of nutrients -both in content as in location– in saline wetlands (Castañeda & Herrero 2008, Díaz *et al*. 1998, Gedan *et al.* 2009). The input of toxic elements in saline wetlands affects the life cycles of flora and fauna and alter the ecosystem as a whole. As an example, the Great Salt Lake in Utah (USA), one of the world's most important reservoirs of *Artemia franciscana* and home to a large diversity of bird and invertebrate fauna, is affected by the input of mercury (Naftz *et al*. 2008). The Great Salt Lake also hosts a salt production plant, although the presence of mercury on its salt has apparently not been studied.

Eutrophication of the water has also been detected near coastal and estuarine salt works (da Silva *et al*. 2014). This is an important threat for any operating salina and should be taken seriously, in order to avoid an unbalanced salt making system and therefore, a loss in the quality of salt crystals obtained (Davis 1980, 2009). The intensification of agriculture also increases the amount of sediment that is found in lower lying wetlands, causing flooding, alterations in salinity and changes in vegetation structure (Álvarez-Rogel *et al.* 2007).

Drainage, desiccation and waste (-water) dumping

Although not common in present times, many wetlands have been drained or desiccated in the past, for public health purposes. In fact, an important share of early limnological studies in Spain were focused on wetland drainage and desiccation (Álvarez 2007). One of the best known cases was the desiccation of the Villena lagoon, in Alicante, in the 18th century, although the largest drainage and desiccation projects were performed halfway the 20th century (Borja *et al*. 2011). Today, the adjacent salinas of Villena are operating at semi-industrial level. A few decades ago, many Mediterranean wetlands were considered the source of infectious diseases, especially malaria. Later, they have often been used as waste(-water) dumps and therefore the image of unhealthy sites was reinforced among the public and even policy makers (Álvarez 2007, Comín & Alonso 1988, Casado & Montes 1991, pers. obs.). Montes & Martino (1987) cite a number of saline wetlands in Spain that have been used

as waste dumps: Las Eras (Segovia), Camino de Villafranca (Ciudad Real) and Laguna del Gobierno (Sevilla).

Infrastructures and urban development

Not so long ago, when the sensitivity towards wetlands was less developed than today, authorities did not hesitate to destroy them in order to build infrastructures instead of diverting them or searching for alternative locations, as present environmental impact assessment legislation obliges. Water reservoirs have been built on top of saline wetlands such as Mar de Ontígola (Madrid), El Atance (Guadalajara), Estanca de Alcañiz (Teruel) or Sariñena (Zaragoza) in Spain (Montes & Martino 1987, pers. obs.) and roads have covered the remains of traditional salt making sites such as Tordelrábano (Guadalajara) (pers. obs.). These cases represent a total loss in both the natural as the cultural values of the salina. Few or no visible remains exist and the sites can be considered ruined.

Many smaller coastal salinas have suffered a similar fate. Such large flat areas near the coast have been very attractive for tourism development projects. Those salinas that failed to survive after a massive mechanization process, became prey of such development projects. The Mediterranean area has as a consequence lost a large percentage of its former 4,000 estimated salt making sites (Crisman *et al*. 2009, Hueso & Petanidou 2011a, Petanidou & Dalaka 2009, Sadoul 1998, see also Chapter 1).

Wild recreation and vandalism

This problem usually arises in isolated areas with low population density. But even with few people exerting them, certain human activities are highly damaging to wetlands. Especially fragile are (inland) saline wetlands, as they are usually dry during the summer months. During this period, given the benign climate and the longer daylight hours, outdoor activities are more popular and people have more leisure time to enjoy them. A lack of public awareness and a poor enforcement of nature and culture protection laws causes that many people practice them uncontrolled. Motor racing, mountain biking, or even all-terrain vehicles driving on dry wetland beds that offer large, flat, isolated areas that are seen as appropriate for these purposes, severely damage their fragile habitats (pers. obs.). Another issue of concern is sheer vandalism, which is practiced mainly upon the cultural heritage of saltscapes: Most of its buildings are abandoned and have become an easy prey for collectors of tools, machinery, etc. or for people wishing to renovate their home with "authentic" pieces of wood, stone, tile, etc. (Carrasco & Hueso 2006c, pers. obs.).

Indirect threats and challenges

Ignorance and red tape

One of the most important threats to saltscapes is, in fact, ignorance of their existence and therefore their natural, cultural and even economical values. Scientists such as Williams (1981, 1986, 1998) or Margalef (1983, 1994) have repeatedly defended that a well-known discipline as Limnology should be devoted to the study of all inland waters and not only fresh waters, as it used to be in the past (see also Jellison 2003). Beyond the flaws detected within the scientific community, the lack of information, historical legacies of land use and tenure and

political constraints to conservation efforts have been identified as threats to wetlands (Castañeda & Herrero 2008). Policy makers seem not to value fresh and saline water to the same extent and some seem to ignore the relevance of saline surface and underground water at catchment level. Also, the different laws that protect the natural and cultural values of salinas are seldom enforced, despite the efforts of civil society to do. Another constraint is the multiplicity of policies and administrative levels that cut across the management of saltscapes. In Spain, any given salt making site has to deal with agricultural, environmental, mining and industry, land use authorities at national, regional and local level. Coastal salt making sites need also to comply with the regulations of coastal land. A typical problem, in this case, is that the law determines that the coastline has a fringe of 100 metres of public right of way, whereas salinas –many of them within this range– are all privately owned. In addition, if the site is selling food-grade salt, it also needs to pass certain food quality controls and, if the site is protected, it should comply with the nature or monument protection laws. All these regulations often contradict themselves. To make things worse, public administration levels may also offer different views, depending on the political party in rule at the moment, at each level.

Climate change

Climate change constituted the largest single anthropogenic threat factor to wetlands. However, its specific effects on each site are yet to be determined. Some observations have already been made at different scales. Global weather change affects rainfall and thus the hydrological regime of saline wetlands. A recent evaluation of the threat of climate change on Spanish wetlands concludes that seasonal saline wetlands of endorheic origin may disappear altogether. Salt lakes (e.g. La Mancha salt lakes, in Ciudad Real; Fuentedepiedra, in Málaga; El Hito and Manjavacas, in Cuenca; Gallocanta, in Zaragoza/Teruel; and Villafáfila, in Zamora), seem to be especially vulnerable to changes in the permanence of water and changes in the biota (i.e. living community). This is especially the case for the smaller, ephemeral ones. Other possible consequences of climate change may be the alteration of ionic composition, eutrophication and hypersalinization, which may also affect the water table and the composition of the brine in operating salinas (Álvarez *et al.* 2005). Another study has proven that *Artemia* and other halophile organisms can be affected by changes in the amount and quality of the water (Gajardo *et al*. 2006).

One of the (expected) effects of climate change is the sea level rise. This constitutes an immediate threat to coastal salinas and salt marshes, which may be affected either by flooding or by changes in tidal range (Adam 2002, Hughes 2004). Similar effects can be found in large saline lakes, such as those found in Central Asia, many of which also feature salt making sites (Zheng *et al.* 2004). Eutrophication has also been identified as a consequence of climate change in saltmarshes (Adam 2002, Hughes 2004). The consequences of eutrophication have been discussed above.

Other human activities

Groundwater, minerals and oil extraction can be a cause of concern, too. Subsidence of the terrain is one of the consequences at local and regional level, causing morphological changes in the wetlands or salinas concerned. Groundwater extraction seems to have caused the subsidence of the Venice lagoon (Adam 2002). The recent surge of fracking as a new method of fossil fuel extraction, has become a threat in several inland salt making sites in Spain (e.g. Añana, in Álava; Poza de la Sal, in Burgos or Rambla Salada, in Murcia), and it usually

encounters strong opposition from residents (pers. obs.). The salt making activity itself can also cause subsidence. Well known are the cases in the area of Northwich (Cheshire, UK), Cargill (Texas, US) and near Delftzijl (Frisia, The Netherlands), where the ground is sinking even in urban area, with a high social and economic cost for residents (Bell *et al.* 2000, Breunese 2010, Johnson 2005). At a smaller scale, subsidence has caused a level drop of the crystalization basins in Imón, Guadalajara (Spain), which are now regularly flooded by rainwater and threat to destroy the built heritage despite its protection as a monument (pers. obs.).

Large scale water diversion and drainage elsewhere in the catchment may cause alterations in the wetlands downstream. Well known is the case of the Aral sea, partialy dry because of the long lasting water withdrawal and diversion from the Amu Darya and Syr Darya rivers, that feed it (Finlayson *et al.* 2005). Side effects of this process are erosion, pollution, loss of biodiversity, poor water quality and, as a consequence, the loss of livelihoods for the local communities. Similar procesess, albeit with different backgounds, are found in other salt lakes worldwide (e.g., the Dead sea in Israel/Jordan, Mono lake in California, Urmia lake in Iran or Ebinur Lake in China) (ISSLR 2015). Although these are not current scenarios in Europe, they do affect the cultural and natural values of saltscapes at global scale.

4.3 Heritage protection measures

The protection of salt heritage is often only partially achieved. Legal protection measures normally focus on either natural or cultural aspects, rarely on both and even more rarely on the role of man in shaping this heritage, and hence there is always a bias towards one of them. On the other hand, the protection of certain heritage assets frequently neglects others with which they are intimately related. Furthermore, these protection measures usually result in "fossilized" sites, commonly dismissing the fact that this heritage and its surrounding landscape is the result of a human activity and that it is –or should be– alive.

The loss of this human activity forces to transform heritage into museum items and landscapes into parks, with the additional costs their "external" management entails. Inevitable as it is if the human activity has stopped altogether, saltscapes and salt heritage should best be preserved "alive", thus including the activity that has shaped them. In the case of salt, this relationship is biunivocal, as the presence of salt in the environment is often both the final cause and consequence of the existence of salt-related heritage. Thus, in this case, the activity that shapes the landscape depends on the resource, which is in turn contained in the landscape, as if it were a virtuous circle.

Table 4.3 offers an overview of protection measures that may be applied to saltscapes, with some emblematic examples for each one of them. Most measures, if not all, are compatible with each other and, most important, compatible with a living landscape.

There are, however, many other international agreements that may be of interest for saltscapes and salt heritage. Table 4.3 shows a list with a selection of relevant policy instruments, agreements and regulations. This list is far from exhaustive and only intends to offer a policy framework.

Some of these policy documents have been translated into effective protection instruments (e.g. World Heritage Sites, Natura 2000), whether legally binding or not, others only

constitute a policy instrument for sectorial plans and programmes. Some of them (as summarised in Table 4.4) will be discussed below (marked with asterisk). Other protection measures do not have a policy or legal framework behind, as will be seen (e.g. ERIH, IBAs).

Table 4.3: Main agreements and plans on the protection of cultural and natural values of heritage

Scope	Name of instrument
International	– *Convention on the Wetlands of International Importance, Ramsar 1971 – *Man and Biosphere Convention, 1971 – *World Heritage Convention, Paris 1972 – Convention on the Conservation of Migratory Species of Wild Animals (CMS), Bonn 1979 – Convention on Biological Diversity (CBD), Nairobi 1992 – Rio Declaration on Environment and Development, Rio de Janeiro, 1992 – Nara Document on Authenticity, Nara 1994 – Charter for Sustainable Tourism, Lanzarote 1995 – Millenium Declaration, New York 2000 – Global Code of Ethics for Tourism, New York 2001 – Quebec Declaration on Ecotourism, Québec 2002 – *Convention for the Safeguarding of the Intangible Cultural Heritage, Paris 2003 – Charter for the Interpretation and Presentation of Cultural Heritage Sites, Québec 2008
European	– Council of Europe's Convention on the Conservation of European Wildlife and Natural Habitats, Bern 1979 – European Convention on the Protection of the Archaeological Heritage, London, 6 May 1969 & ratified in La Valetta, 16 January 1992 – Convention for the Protection of the Architectural Heritage of Europe, Granada, 3 October 1985 – Mediterranean Landscape Charter, Seville 1993 – *European Landscape Convention, Florence 2000 – Convention on the Value of Cultural Heritage for Society, Faro, 2005 – *Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds – *Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora
Spain	– *Ley 16/1985 de Patrimonio Histórico Español – Ley 43/2003 de Montes, de 21 de noviembre, modificada por la Ley 21/2015, de 20 de julio – Ley 45/2007, de 13 de diciembre, para el desarrollo sostenible del medio rural – Ley 42/2007, de 13 de diciembre, del Patrimonio Natural y de la Biodiversidad, modificada por la Ley 33/2015, de 21 de septiembre – Ley 2/2011, de 4 de marzo, de Economía Sostenible – Ley 21/2013, de 9 de diciembre, de evaluación ambiental – *Plan Nacional de Salvaguarda del Patrimonio Inmaterial (2011) – *Plan Nacional de Patrimonio Industrial (2011) – *Plan Nacional de Paisaje Cultural (2012) – *Plan Nacional de Educación y Patrimonio (2016) – *Plan Sectorial de Turismo de Naturaleza y Biodiversidad (2013-2020) – *Plan Estratégico del Patrimonio Natural y la Biodiversidad (2011-2017) – *Plan Estratégico Español para la Conservación y Uso Racional de los Humedales (2000)

Source: Own elaboration

Table 4.4: Protection instruments for saltscape values

Name of measure	Legal frame of reference	Scope	Policy focus	Emblematic saltscapes*
World Heritage[35]	UNESCO World Heritage Convention (París, 1972)	Global	Cultural, natural	Salt mines of Hallstatt (Austria) and Wieliczka (Poland), Saltworks of Arc-et-Senans and Salins-les-Bains (France)
Biosphere Reserve[36]	UNESCO Programme Man and Biosphere	Global	Natural	Mancha Húmeda, Lanzarote, Terres del Ebre… (Spain)
Ramsar[37]	Convention on the Wetlands of International Importance (Ramsar 1971)	Global	Natural	There are 77 Ramsar sites with predominant saltscapes
Important Bird Areas[38]	A BirdLife programme on the conservation of critical areas for the birds of the world	Global	Natural	Cabo de Gata, Santa Pola, Janubio… (Spain), Grand Turk Salinas (UK), Lagunas de Ecuasal (Ecuador), Salinas Grandes (Argentina), Salinas y Aguada Blanca (Peru)…
Geopark[39]	UNESCO World Network of Geoparks	Global	Geological	Cabo de Gata-Níjar (Spain)
Other natural protected areas[40]	National or regional protection measures in each country	Global	Natural	Unknown figures at global scale
Land stewardship[41]	Custody agreements, private land uses	Global	Natural	Salines de la Trinitat (Spain), La Camargue (France)…
European Cultural Itinerary[42]	Partial Agreement on the Creation of Cultural Itineraries by the Council of Europe	Europe	Cultural	No specific examples, The "Ruta de Don Quijote" crosses several salt making areas in Castilla – La Mancha. The Traditional Salt Route of the Atlantic hopes to become an ECI.
Cultural Landscape[43]	European Landscape Convention (Florence, 2000)	Europe	Cultural, natural	Valle Salado/Salinas de Añana (Spain)
ERIH Site[44]	Network of European Industrial Heritage	Europe	Industrial	Borlach Museum (Germany), Marsal (France), Lion Saltworks (UK)…
Special Conservation Zone	Natura 2000 network, a European network for the protection of biodiversity	Europe	Natural	57 protected areas with acknowledged saline habitats are found in Spain and Portugal[45]
Good of Cultural Interest[46]	Ley 16/1985, de 25 Junio, de Patrimonio Histórico Español	Spain	Cultural	Salinas de Añana, Imón, Poza de la Sal, Peralta de la Sal…

*See Annex 3 for the location of European sites, source: Own elaboration

[35] URL: http://whc.unesco.org/ [Retrieved August 2014]
[36] URL: http://www.unesco.org/new/en/natural-sciences/environment/ecological-sciences/man-and-biosphere-programme/ [Retrieved August 2014]
[37] URL: http://www.ramsar.org [Retrieved August 2014]
[38] URL: http://www.birdlife.org [Retrieved August 2014]
[39] URL:http://www.unesco.org/new/en/natural-sciences/environment/earth-sciences/global-geoparks/ [Retrieved August 2014]
[40] Chape (2005) cite the existence of over 1,000 legal protection measures for natural areas. Hence it is virtually impossible to estimate the quantity of saltscapes protected by these measures.
[41] "Land custody is a set of strategies and instruments that intend to motivate owners and users of the land in the conservation and sound use of the natural, cultural and landscape values and resources. To achieve this, it promotes agreements and continuous collaboration mechanisms between owners and other private and public stakeholders, as explained by Basora & Sabaté (2006)
[42] http.//www.coe.int/routes [Retrieved August 2014]
[43] Cultural landscapes are not legal protection measures at European scale, but they are used in certain regions, such as the Basque Country. More on European cultural landscapes in Council of Europe (2000)
[44] http://www.erih.net/ [Retrieved August 2014]
[45] See Carrasco (2013)
[46] http://www.mecd.gob.es/cultura-mecd/areas-cultura/patrimonio/bienes-culturales-protegidos.html [Retrieved August 2014]

4.3.1 Direct protection measures

International scope

The Ramsar Convention

The Convention on Wetlands of International Importance, called the Ramsar Convention, is the intergovernmental treaty signed in Ramsar, Iran, in 1971 and adopted by most UN countries worldwide. The Convention provides the "framework for the conservation and wise use of all wetlands through local and national actions and international cooperation, as a contribution towards achieving sustainable development throughout the world"[47].

The Convention considers wetlands among the most diverse and productive ecosystems as that provide essential services and supply all fresh water needed by man. However, they continue to be degraded and converted to other uses and therefore deserve protection. The Convention uses a broad definition of wetlands. It includes all lakes and rivers, underground aquifers, swamps and marshes, wet grasslands, peatlands, oases, estuaries, deltas and tidal flats, mangroves and other coastal areas, coral reefs, and all human-made sites such as fish ponds, rice paddies, reservoirs and salt pans. The Ramsar Convention protects over 2,000 sites worldwide. Of these, among the human-made wetlands, are the so called "salt exploitation sites". Of the 77 sites included in this category, Spain includes 12 of them, one-sixth of all. At least nine of the European Ramsar sites are or include artisanal salinas, namely:

- Bahía de Cádiz, Spain (2002)
- Estuario do Sado, Portugal (1996)
- Golfe de Morbihan, France (1991)
- Lago de Caicedo – Yuso y Salinas de Añana, Spain (2002)
- Mondego estuary, Portugal (2005)
- Ria Formosa, Portugal (1980)
- Salinas de Ibiza y Formentera, Spain (1993)
- Saline di Cervia, Italy (1981)
- Sečoveljske soline, Slovenia (1993)

Although beyond the scope of this work, it is worth noting that natural saline inland wetlands are also protected by the Ramsar Convention. Among these are permanent and seasonal or intermittent saline marshes, pools, lakes and flats. Of the 471 such wetlands protected worldwide, Spain hosts 39, roughly one tenth. The above figures should give an indication of the richness and representativity of saltscapes in Spain, both in relative as absolute terms.

Man and Biosphere Programme

Launched in 1971, UNESCO's Man and the Biosphere Programme (MaB) is an Intergovernmental Scientific Programme that aims to establish a scientific basis for the improvement of relationships between people and their environments. According to the programme, "MaB combines the natural and social sciences, economics and education to improve human livelihoods and the equitable sharing of benefits, and to safeguard natural and managed ecosystems, thus promoting innovative approaches to economic development that are socially and culturally appropriate, and environmentally sustainable". Today, the

[47] URL: http://www.ramsar.org/ [Retrieved August 2015]

World Network of Biosphere Reserves currently counts 651 biosphere reserves in 120 different countries. Although the database does not allow to perform a thematic search, a few biosphere reserves in Europe host salt making sites, of which two represent artisanal salt making sites:

- Po delta, Italy (2015)
- Terres del Ebre, Spain (2013)

The World Heritage Convention

UNESCO has been often cited here as the main source of reference on heritage protection and therefore it seems relevant to discuss its World Heritage Programme in relation to saltscapes in some detail. UNESCO has long ago understood the relationship between human livelihoods and landscapes, between the tangible and intangible elements of culture, and offers several protection instruments to this end. Perhaps the best known and broadest in scope is the World Heritage Convention, which is an international treaty between Member States of the United Nations that "seeks to identify, protect, conserve, present and transmit cultural and natural heritage of Outstanding Universal Value to future generations" (UNESCO 1972). The World Heritage Programme stresses the importance of the liaison between nature, man and culture. Salt heritage is a good example of how the three interact in a delicate balance (Perraud 2002).

The World Heritage List counts with few salt heritage sites and even fewer saltscapes. So far, the following salt-related sites have been listed:

- Wieliczka and Bochnia Royal Salt Mines, Poland (1978)
- From the Great Saltworks of Salins-les-Bains to the Royal Saltworks of Arc-et-Senans, the Production of Open-pan Salt, France (1982)
- Hallstatt-Dachstein / Salzkammergut Cultural Landscape, Austria (1997)
- Uvs Nuur Basin, Mongolia and Russian Federation (2003)[48]

It is worth noting that three of the four sites refer to salt mines or industrial salt production, with a variable interest in the surrounding landscape. These are relatively old sites and only the younger one (Halstatt-Dachstein) has been considered as a cultural landscape site. More recently, the Uvs Nuur Basin site protects a hypersaline lake and includes its watershed. Some other World Heritage sites may incidentally include some salt heritage, such as Doñana National Park in Spain, but it has been irrelevant in its nomination.

Hence, bearing in mind that salt heritage is present in virtually all continents, plus that saltscapes and salt making are so much more than a mining activity and how the production of salt has shaped our different civilisations, perhaps this list can be considered poorly representative.

It seems, however, that salt values are becoming better understood and are more valued by the authorities. In order to consider a nomination for inscription in the World Heritage list, it should be first included in the so called "tentative list", elaborated by the State parties. This tentative list for UNESCO World Heritage includes salt heritage from many different geographical areas, with a total of 18 sites worldwide and 7 in Europe. Of these, only two host artisanal salinas:

[48] Also a Man and Biosphere reserve and Ramsar site

- *Marais salants* de Guérande, France (2002)
- Cultural Landscape of Valle Salado, Spain (2012)

This tentative list shows areas which are in different stages of the process of applying to become World Heritage Sites, hence have not been officially designated yet. This list, however, gives a good indication of the sensitivity that is starting to exist towards salt heritage and saltscapes. Of this list, only two sites (Hall in Tyrol and the Salt towns of Colombia) refer to mining places, whereas two are protecting natural salt lakes (Chott El Jerid and Lake Tuz). The rest of the sites offer a broad variety of coastal and lacustrine salt making sites, with very different natural, cultural and intangible heritage assets. An interesting example is the cultural itinerary Route du Sel, in Niger, a still functioning trade route. The list also shows enough geographic representativeness, with 6 European, 5 African, 4 Asian and 3 American proposals. It should be noted, however, that some sites have duplicated their presence in this tentative list, such as Salinas de Añana, in Spain[49]. Since the tentative list does not give an indication of actual protection, it serves only as an illustration of the variety of salt heritage that is considered important enough to be presented to UNESCO.

Despite the quality of the sites listed here, many others are surprisingly missing. At the risk of leaving many sites (and authors of reference) unnamed, a proper list of world salt heritage should include the salt mines of Bilma in Niger or Taoudenni in Mali (Altimir 1949, Lovejoy 1986, Petanidou 1997) or other interesting mines such as those in Cardona in Spain or Slănic-Prahova, Târgu-Ocna or Turda in Romania (Harding 2013); the salt graduation towers in northern Europe or the open fire salt pans such as those found in industrial areas of France, Germany or the UK (Emons & Walter 1988) or the recovered Mediaeval open-pan salt making site of Læsø in Denmark (Hueso & Carrasco 2010); large coastal salinas such as the Camargue, Ebro delta, Messolonghi in the Mediterranean or Guerrero Negro in the Baja California peninsula (Ewald 1997, Hueso & Petanidou 2011a) or the smaller volcanic saltworks of the Canaries (Luengo & Marín 1994); inland saline lakes in Europe such as Gallocanta or Villafáfila (Hueso & Carrasco 2009a), or Asian lakes such as Urmia in Iran or Alakol in Kazakhstan, the Murray river basin in Australia and many others natural saltscapes (Williams 1981); the inland salt making sites of Zigong or Yancheng in China (Kwan 2001, Yoshida 1993), Maras in Peru (Beltran 2014, Palomino 1985), Peñón Blanco or Zapotitlán, in Mexico (Reyes 1995, 1998; Castellón 2008); the sheer diversity and abundance of salt making sites in the Iberian peninsula as a whole (Carrasco & Hueso 2008a); or even the old practices of s*leeching*, *selnering* or burning of other salt-saturated vegetation, some still practised in isolated tropical areas (Hocquet *et al*. 2001)… . The further this list grew, more understanding should arise that salt, its production, distribution and trade, its hinterland and its landscape, is a universal value for humankind.

Convention for the Safeguarding of the Intangible Cultural Heritage

The Convention for the Safeguarding of Intangible Cultural Heritage was signed in Paris in 2003 during a UNESCO General Conference. The Convention aims at safeguarding the uses, representations, expressions, knowledge and techniques that communities, groups and, in some cases, individuals, recognise as an integral part of their cultural heritage. This intangible heritage is found in forms such as oral traditions, performing arts, social practices, rituals, festive events, knowledge and practices concerning nature and the universe, and traditional

[49] This may give an indication tan some of the sites included in the tentative list have desisted from being a candidate or their dossiers have cooled down over time.

craftsmanship knowledge and techniques. The Convention keeps three types of lists: a) intangible cultural heritage in need of urgent safeguarding measures; b) register of best safeguarding practices; and c) representative list of the intangible cultural heritage of Humanity. So far, none of them acknowledge traditional salt making as a global heritage worth of protecting, although craftsmanship in other fields, even productive ones (textiles and fabrics, visual and performing arts, games, cuisine, agricultural know-how…) is represented in them. However, the Convention offers a new look at the values of cultural landscapes, which have often been neglected. It is expected to gain relevance in the near future.

Important Bird and Biodiversity Areas

The Important Bird and Bodiversity Areas are those areas identified by the BirdLife Partnership as places of greatest significance for the conservation of the world's birds. As a result, over 12,000 Important Bird and Biodiversity Areas (IBAs) are now recognised. Moreover, since birds have been shown to be effective indicators of wider biodiversity, the protection of these sites would help ensure the survival of a correspondingly large number of other animal and plant species. Fully 33% of IBAs lack any form of formal protection and a further 45% are only partially protected. Achieving adequate protection for these sites is among the most urgent of global conservation priorities of BirdLife. Of the identified IBAs, 55 are explicitly located in salt making sites or saline lakes, of which 24 are in Europe. Six of them host artisanal salinas (BirdLife 2016):

- Cervia saltpans, Italy (2000)
- Janubio saltpans, Spain (2000)
- Salt-pans of Ibiza and Formentera and Freus isles, Spain (2007)
- Sečovlje saltpans, Slovenia (2011)
- Stagnone di Marsala and Trapani saltpans, Italy (2000)
- Strunjan saltpans, Slovenia (2011)

Global Geoparks Network

The Global Geoparks Network (GGN) provides a platform for cooperation and exchange between experts and practitioners in geological heritage, and its promotion. Under the umbrella of UNESCO, and through cooperation with the global network partners, important local and national geological sites gain worldwide recognition and benefit from the exchange of knowledge and expertise with staff of other Geoparks. The network comprises 111 Geoparks. Within Europe, only two of them specifically include saltscapes, namely Cabo de Gata – Níjar and Molina and Alto Tajo Geoparks. The latter hosts one operating artisanal salina, San Juan in Saelices de la Sal, in Guadalajara.

Other natural protected areas

The International Union for the Conservation of Nature (IUCN) regularly publishes the World Database on Protected Areas, which offers information on the world's protected areas, according to the five categories established by IUCN member states. The 2014 database report included the results of an analysis of 197,368 terrestrial protected areas, covering over 15% of the world's landmass, and 12,076 marine protected areas, covering ca. 8% of the

ocean's surface. Together they total more than 209,000 sites. These are all sites designated at a national level (e.g. national parks), under regional agreements (e.g. Natura 2000 network) and under international conventions and agreements (e.g. natural World Heritage sites). There are 2,363 protected areas recognised under international conventions in the database. Many sites are covered by more than one designation category, some of which may not coincide with one of the five IUCN protected area categories. Given the figures above, it is virtually impossible to know how many of these sites actually protect (artisanal) salt making sites at global scale. However, some general indications can be found. The Convention of Biological Diversity (CBD) has selected inland waters as one of its biomes. Within this biome, of the 435,696 square kilometres of salt pans and saline wetlands existing worldwide, 105.540 square kilometres are protected in one way or another, which means a coverage of 24,2% (Lehner & Döll 2004), well above the average of 20% for other biotope types within this biome (Juffe-Bignoli *et al*. 2014).

Another relevant category, given the fact that most salt making sites are privately owned, are the so-called privately protected areas (PPA). These are defined by IUCN as "a protected area under private governance by individuals and groups of individuals; non-governmental organisations; corporations, including commercial companies and corporations set up by private owners to manage several PPAs; for-profit owners; research entities (universities, field stations); or religious entities" (Juffe-Bignoli *et al*. 2014). Alas, the global coverage of PPAs is currently unknown.

Land Stewardship

Land stewardship is a strategy to involve private landowners and users in the conservation of nature and landscape, with support from and inputs by a broad range of civil society groups. It is based on voluntary agreements between landowners/users and land stewardship organisations, usually NGOs or public authorities at local or regional level. The ultimate aim of land stewardship is the maintenance and restoration of nature, biodiversity, ecological integrity and landscape values. Indirectly, the cultural and intangible values the sites host, will also be preserved (Quer *et al.* 2013, Sabaté *et al.* 2012).

The land stewardship approach has a long tradition in certain European countries. Organisations such as *Conservatoire du Littoral* in France or *Stichting Natuurmonumenten* in The Netherlands have a long history of such public/private and private/private partnerships. Its greatest advantage is its versatility and adaptability: It uses a wide variety of tools and resources and involves many different stakeholders, especially landowners and NGOs. One of the strengths of the stewardship approach is its horizontal governance model: all society groups can use it or participate in some way. Today, land stewardship is used in most continents of the world as a nature and biodiversity management and conservation tool (Quer *et al.* 2012, Sabaté *et al.* 2013).

As of yet, there is no global or European organization covering or inventorying land stewardship initiatives at international scale, so no systematic review can be offered here. However, a few well-known examples of saltscape management have been achieved by using land stewardship agreements. In the salins de Villeneuve, in the Camargue, France, acquired in 1992, the *Conservatoire du Littoral* has one of its flagship programmes. In Spain, the *Fundació Territori I Paisatge*, a not-for-profit institution and member of the reference organization *Xarxa de Custòdia del Territori*, is the manager of the salinas of La Trinitat, in Tarragona. Today, these salinas produce salt and have a visitor programme running.

Given its flexibility, land stewardship has become a useful tool for the recovery of the cultural heritage of traditional salinas in inland Spain. A successful example are the salinas de San Juan, in Guadalajara, run by a Foundation. Other institutions are exploring similar solutions to recover their heritage.

European scope

European Landscape Convention

The European Landscape Convention (ELC) aims at the protection, mangement and planning of landscapes at continental level. It considers landscape as "a key factor in individual and social well-being and people's quality of life", and that it "contributes to human development and serves to strengthen the European identity" (Déjeant-Pons 2006). Although initially aimed at the protection of natural landscapes, it has moved towards the inclusion of cultural and intangible heritage as well (Jones *et al.* 2007).

The ELC has not been translated into concrete protection measures that can be applied to specific areas, it rather offers a policy framework. However, in certain regions, protected "cultural landscapes" exist as a natural and cultural heritage protection instruments. This is the case, for instance, of the Basque Country. One of the beneficiaries of this measure is the Valle Salado / Salinas de Añana complex, in Álava.

European Cultural Routes

Lauched by the Council of Europe in 1987, the cultural routes programme aims to show how the heritage of the different countries and cultures of Europe contributes to a shared and living cultural heritage. The routes are grass-roots networks promoting the principles which underlie all the work and values of the Council of Europe: human rights, cultural democracy, cultural diversity, mutual understanding and exchanges across boundaries. They act as channels for intercultural dialogue and promote a better knowledge and understanding of European history. Many cultural and thematic routed criss-cross the continent. In Spain alone, over 600 exist (Turinea 2016). However, in order to be considered a European Cultural Itinerary (ECI), the route has comply with certain requisites. To date, 33 cultural routes have been acknowledged by the Council of Europe, but none of them has salt as a theme. The closest intinerary is the European Route of thermal heritage and thermal towns. One of its members is a well known salt making area in Italy, Salsomaggiore. In Spain, the Route of Don Quixote passes through several salt making areas in Guadalajara and Albacete. The Traditional Salt Route of the Atlantic, created in 2013, aims to be recognised as an ECI.

European Route of Industrial Heritage

The European Route of Industrial Heritage (ERIH) is a tourism information network of industrial heritage in Europe. It currently presents more than 1,000 sites in 44 European countries. Among these sites there are 80 Anchor Points which build the virtual ERIH main route. The industrial history of these landscapes can be discovered in detail on seventeen Regional Routes. All sites relate to thirteen different European Theme Routes which show the diversity of European industrial history and their common roots. Each Theme Route takes up specific questions relating to European industrial history and reveal potential links

between radically different industrial monuments all over Europe. The result is a "circuit diagram" of the common routes of European industrial heritage. The theme route on salt includes 24 sites, of which several are artisanal salinas (although the focus in ERIH lies on the museums rather than the site itself):

- Figueira da Foz: Figueira da Foz salt museum
- Gerri de la Sal: Salt museum
- Imón: Salinas
- Læsø: Læsø Saltsyderi
- Piran: Sergej Masera Maritime Museum - Museum of Salt-Making
- Pomorie: Salt museum
- Salinas de Añana: Valle Salado

Natura 2000 network

The European Commission launched an ambitious project in order to efficiently protect the most representative species and habitats of the EU by creating the Natura 2000 network. To this end, among other actions, a comprehensive catalogue of European habitats was prepared. Some of the habitats were considered in danger of disappearing and enjoy a special priority status when it comes to their protection. The final list of habitats contains six that could be considered as saltscapes (Hidalgo 2015; see Table 4.5), as these have been defined above.

Once this catalogue of habitats was made, each member state had the responsibility to designate areas to protect a representative part of them, by creating the so called "Sites of Community Interest" or SCIs. These sites may contain one or several habitats and form part of the Natura 2000 network, together with the so called, "Special Protection Areas" or SPAs, devoted to the protection of birds. A few years ago, the member states finally completed the designation of both their SCIs as their SPAs. Today, the member states are in the process of elaborating the management plans for their Natura 2000 sites.

A brief look at the number of designated SCIs per country and per habitat type quickly shows that the Mediterranean countries in general and Spain in particular are the realm of European saltscapes (Table 4.6). Portugal, however more modestly, also hosts most of the saltscapes represented by these habitats. An exception to this is habitat type 1340* (inland salt meadows), which belongs to the continental biogeographic region, not represented in most Mediterranean countries and not at all in Spain or Portugal. Of all other saltscapes represented by these habitat types, Spain and Portugal host 46% of all designated SCIs in the EU that protect them. These figures give an idea of the importance and representativeness of these saltscapes in the Iberian context. However, the previous table only gives an estimate of *protected* saltscapes in the EU. It is rather difficult to estimate the total number of valuable saltscapes in a certain region, as many of them are seasonal, intermittent or artificially created by soil erosion, salt water intrusion or excessive irrigation (Williams 1998). It has to be assumed that the number of saltscapes protected within the Natura 2000 network in the different EU countries is representative of their total number. Also, bearing in mind that hardly any inland solar evaporation salt making facilities exist outside Iberia, and that Spain and Portugal host (the remains of) 500 such sites (Carrasco & Hueso 2008a), the Iberian Peninsula may be considered as the European reservoir of saltscapes both from a qualitative as a qualitative point of view and as such they should be protected (Casado & Montes 1991, González Bernáldez 1981, Guerrero & de Wit 1992, Montes & Martino 1987).

Table 4.5: Habitat types recognized by the 1992 EC Habitats Directive that can be considered as saltscapes

Annex 1[1] code nr.	Habitat type
13	**Atlantic and continental salt marshes and salt meadows**
1310	***Salicornia* and other annuals colonizing mud and sand** Formations composed mostly or predominantly of annuals, in particular *Chenopodiaceae* of the genus *Salicornia* or grasses, colonising periodically inundated muds and sands of marine or interior salt marshes.
1340*	**Inland salt meadows** Non-coastal natural salt basins made up of different habitat types consisting of zones of seepage of saline water, running or stagnant saline water, with typical halophilous vegetation and of reed beds at the edge of brackish waters.
14	**Mediterranean and thermo-Atlantic salt marshes and salt meadows**
1410	**Mediterranean salt meadows (*Juncetalia maritimi*)** Various mediterranean communities and tall rush saltmarshes dominated by *Juncus maritimus* and/or *J. acutus;* short rush, sedge and clover saltmarshes and humid meadows behind the littoral, rich in annual plant species and in *Fabacea*, mediterranean halo-psammophile meadows; Iberian salt meadows; halophilous marshes along the coast and the coastal lagoons; humid halophilous moors.
1420	**Mediterranean and thermo-Atlantic halophilous scrubs (*Sarcocornetea fruticosi*)** Perennial vegetation of marine saline muds (schorre) mainly composed of scrubs, essentially with a Mediterranean-Atlantic distribution
1430	**Halo-nitrophilous scrubs (*Pegano-Salsoletea*)** Halo-nitrophilous scrubs (matorrals) belonging to the *Pegano-Salsoletea* class, typical of dry soils under arid climates, sometimes including taller, denser brushes.
15	**Salt and gypsum inland steppes**
1510*	**Mediterranean salt steppes (*Limonietalia*)** Associations rich in perennial, rosette-forming *Limonium spp*. or esparto grass (*Lygeum spartum*), occupying, along Mediterranean coasts and on the fringes of Iberian salt basins, soils temporarily permeated (though not inundated) by saline water and subject to extreme summer drying, with formation of salt efflorescence.

[1]Habitats are listed in the Annex 1 of the Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (asterisk indicates priority habitats)
Sources: European Commission (2003) and Hidalgo (2005)

Table 4.6: Number of designated SCIs per country and habitat type

Country	Habitat type					
	1310	**1340***	**1410**	**1420**	**1430**	**1510***
Belgium	3					
Cyprus	1		1	1		
Denmark	34	6				
Estonia	2					
France	55	10	15	21		
Germany	13	49				
Greece	7		9	8		1
Ireland	23		35	2		
Italy	49		53	45	7	41
Latvia	3					
Malta			1	3		
Netherlands	21					
Poland		1				
Portugal	9		8	8	7	2
Slovenia		2				
Spain	79		73	124	55	68
Sweden	33					
United Kingdom	18	1		5		
Total SCIs	**350**	**69**	**195**	**217**	**69**	**112**

Source: Own elaboration

National scope: The case of Spain

Given the relenvace of the Sanish case studies within this thesis, some of the national plans of importance for the preservation of the natural and cultural values of saltscapes are briefly presented here.

Heritage-related plans in Spain

National plans are defined as "management instruments created to achieve three ends: establishing a unified action methodology on ensembles of assets; programming investments according to conservation needs and coordinating participation of the different institutions intervening in the conservation of these heritage ensembles" (IPCE)[50]. Seven national plans have been identified as most relevant in this context.

National Plan for the Safeguarding on Intangible Heritage (Plan Nacional de Salvaguarda del Patrimonio Inmaterial) *(2011)*
The Spanish Historical Heritage Act (*Ley 16/1985, de 25 de junio, del Patrimonio Histórico Español*), acknowledged what is today known as intangible heritage and declared the need to elaborate a specific plan. Its goals are to promote research on intangible heritage; to develop criteria and methodology for interventions on intangible cultural heritage; and to design dissemination strategies. The plan characterizes the intangible cultural manifestations in Spain and highlights their vulnerability.

National Plan of Industrial Heritage (Plan Nacional de Patrimonio Industrial) *(2011)*
This second version of this plan aims at the protection and conservation of a type of heritage in danger of deteriorating and disappearing rapidly. The reason to elaborate a second plan is that some flaws had been detected in the accomplishment of the goals of the first, namely the lack of monitoring and control of the actions on industrial heritage; the uneven distribution of funds; the lack of coordinated inventories and the need to review qualification criteria. These have become major goals of the new plan.

National Cultural Landscape Plan (Plan Nacional de Paisaje Cultural) *(2012)*
The plan has the goal to safeguard landscapes of cultural interest, and to guarantee their viability. The plan acknowledges the complexity and vulnerability of cultural landscapes, especially because of a general lack of legal protection. To this end, the plan intends to identify and characterize cultural landscapes, as well as to research, protect, improve and revitalize these sites, from a perspective of sustainable development. Besides, the plan aims at obtaining policy recognition of cultural landscapes, at disseminating their values among the public and at enhancing international, national and regional cooperation to achieve these goals.

National Plan for Heritage Education (Plan Nacional de Educación y Patrimonio) *(2016)*
The plan considers that the education focused on heritage values represents "one of the most effective and beneficial lines of action in order to guarantee the preservation of cultural assets" (IPCE, see footnote). The plan aims at establishing the theoretical basis and criteria of heritage education in Spain, at promoting research in this field and

[50] Information retrieved from the websites of the Instituto de Patrimonio Cultural de España (URL: http://ipce.mcu.es), Ministerio de Pesca, Agricultura y Medio Ambiente (URL: http://www.mapama.gob.es) and Ministerio de Energía, Turismo y Agenda Digital (URL: http://www.minetad.gob.es). [Retrieved January 2017].

incorporating it in the official curricula. To this end, it will contribute to develop didactic materials and training for professionals. The plan also hopes to improve international, national and regional cooperation in this field.

Strategic Plan for Natural Heritage and Biodiversity (Plan Estratégico del Patrimonio Natural y la Biodiversidad) (*2011-2017*)
This plan is a fundamental pillar of the The Natural Heritage and Biodiversity Act (*Ley 42/2007, de 13 de diciembre, del Patrimonio Natural y de la Biodiversidad*). Its goals are to promote the conservation, sustainable use and restoration of the natural heritage and biodiversity of Spain, outlined in 40 specific objectives in the text. The plan presents the current situation of biodiversity in Spain, with special interest in its threats and provides a framework for the planning for their conservation and sustainable use and a perspective on their ideal long-term situation. Importance is given to the cooperation, collaboration and coordination between administrations, the integration of biodiversity into sectoral policies and the estimation of budgetary requirements for the implementation of the plan itself.

Sectorial Plan of Nature-based Tourism and Biodiversity (Plan Sectorial de Turismo de Naturaleza y Biodiversidad) (*2013-2020*)
The Natural Heritage and Biodiversity Act included the need to create a plan for the sustainable use of natural values. The plan aims at reinforcing positive synergies between nature conservation and ecotourism, taking advantage of the leading position of Spain with both assets (biodiversity and tourism) within Europe. The idea behind the plan is to create employment and to obtain profit from this synergy. To this end, efforts will be made to provide training for practitioners and dissemination to the public.

Spanish Strategic Plan for the Conservation and Rational Use of Wetlands (Plan Estratégico Español para la Conservación y Uso Racional de los Humedales) *(2000)*
The plan stems from the requirement to the Ramsar Convention member states to elaborate national strategies for the protection of wetlands. The plan aims at being the instrument of reference for all sectorial policies (water and coastal management, transport, spatial planning, forestry, agriculture, mining, industry and fisheries), to coordinate and control actions that should be compatible with the preservation of these ecosystems. Among its specific goals, the plan hopes to guarantee this conservation and, if needed, restoration of wetlands that are degraded or have been destroyed.

Bien de Interés Cultural (BIC) – the protection of Spanish cultural heritage

Another approach to the protection of saltscapes is their conservation as cultural heritage. The Spanish legislation (Spanish Historical Heritage Act) may designate historic buildings, sites or other tangible heritage as *Bien de Interés Cultural* (Good of Cultural Interest, BIC), which confers them with a protection status and enforce their owners and, subsidiarily, the local and regional authorities, to protect and maintains them. The Act acknowledges five types of BICs, namely Historical Monuments, Historical Centres, Historical Gardens, Historical Sites and Archaeological Zones. Most BIC are churches, monasteries, castles and fortifications. However, in later years, other more modest heritage has started to be declared as BIC. Among the relatively new designated sites are a number of salt making sites, which belong to the different categories named above. Of the almost 16,000 declared BIC, 20 are salt making sites, of which 45% (9 sites) are inland (see Figure 5.3). The declaration of a site

as a BIC normally only affects the man-made structures (buildings, engines, infrastructures) found in it and does not include its surrounding landscape or natural values. In fact, only in two cases (Salinas de Añana, in the Basque Country, and Salinas de Saelices de la Sal, in Castile – La Mancha) do two protection statuses overlap (SCI and BIC)[51]. Of the nine study sites, four have the consideration of Site of Ethnographic Interest -a subcategory of Historical Site- by which not only the tangible heritage values are acknowledged, but mainly the intangible ones: Arcos de las Salinas, Peralta de la Sal, Poza de la Sal and Rambla Salada. These, being younger protected sites, may have benefitted from a growing sensitivity towards intangible heritage in recent times. The rest, declared well before, are considered Historical Monument (Añana, Gerri de la Sal, Imón, San Juan). A case apart is Espartinas, declared as Archaeological Zone, which seems to make more sense given its associated values.

Some regional governments in Spain are starting to understand cultural heritage as part of a geographic context and refer to it as "cultural landscapes" or "territories" (i.e. Castile and León, Aragón). Several non-governmental organizations devoted to the protection of industrial, archaeological and mining heritage are using the concept for the protection of whole mining districts (International Committee for the Conservation of the Industrial Heritage/TICCIH, Spanish Society for the Defence of Geological and Mining Heritage/SEDPGYM, Industrial Archaeology Association/INCUNA, Spanish Society for History of Archaeology/SEHA, etc.; see Table 4.9), including also their natural (mainly geologic, but not only) heritage. This trend may be useful for saltscapes too, as their cultural and natural values, especially in those sites where salt has been obtained by humans, are tightly interwoven.

Summary of protection measures

The complex nature of salinas, i.e. multifunctional productive saltscapes, makes them difficult to classify under one thematic category. All sectorial protection measures (whether devoted to cultural, natural, geological or industrial heritage) tend to partially acknowledge sites that contain salt-related values, but fail to recognise many others that may be equally valuable.

Table 4.7: Summary of protection measures for European salt-related sites

Instrument	Nr of salt-related sites in Europe	Nr artisanal salinas represented	% artisanal salinas	Study sites involved
Ramsar	40	7	18 %	Guérande Sečovlje Salinas de Añana
Man and Biosphere	7	2	29 %	-
Geoparks	2	1	50 %	San Juan/Saelices de la Sal
World Heritage Site (incl. tentative list)	11	1	9 %	Salinas de Añana Guérande
ERIH	24	5	21 %	Gerri de la Sal Salinas de Añana Læsø Saltworks Sečovlje
IBAs	25	5	20 %	Sečovlje

Source: Own elaboration

[51] In Imón, both protection instruments coincide, but do not overlap: they carefully border each other.

Clearly a systematic inventory of saltscapes and their values is needed, at least at European scale. Besides, despite their relevance in the maintenance of the landscape, the intangible values of the sites are not considered at all or only partially recognised in UNESCO's programmes (Ramsar, World Heritage, MaB), in which they neither seem to constitute a priority. Finally, with productive saltscapes, being complex cultural landscapes with different sets of values, one would expect them to be listed simultaneously under different protection instruments. This only happens partially. In fact, some of the few sites that do overlap have been selected as study sites in this thesis (see Table 4.7).

4.3.2 Indirect protection measures

Thematic networks

Cultural routes and itineraries –whether acknowledged as ECI- or not– are a powerful instrument to enhance awareness on a certain territory, create cohesion between different elements of a certain form of heritage or within a region, to promote socioeconomic development associated to tourism and, ultimately, to protect its heritage. Routes can contribute to attract visitors to sites that would not be poles of attraction by themselves, as may be the case of salinas. Two of the routes are discussed below.

Cultural routes specialised in productive activities –such as salt making– usually deal with sites that have abandoned their operation or have lost the productive connection to their hinterland, being now somehow isolated from it. This is the case of most salinas. Even if they are still operating, there has been a change in the flows of salt trade, which has disconnected them from their historical liaisons to their territory and need to shift to the new connections that can be built from a contemporary perspective (via modern flows of trade, tourism, cultural uses…). Cultural routes may contribute to reconnect sites with their former hinterland, giving a new sense to these historical liaisons. They also allow them to connect with their fellow sites, with whom they share not heritage but similar difficulties (Bangstad 2011).

Cultural routes and itineraries are also a powerful tool to network between sites, to exchange resources, experience, good practices and know-how (Meyer 2004). A network should be "formulated among groups possessing a relationship of mutual support and a common objective, and approximately equal power" (Moulin & Boniface 2001). In addition, if cultural routes and itineraries want to be true poles of socioeconomic development, there should be a horizontal management that reflects and attends to the needs of all partners, finding a balance between the preservation and the commercial exploitation of heritage.

The Salt Traditional Route of the Atlantic

As mentioned above, the Salt Traditional Route of the Atlantic (STRA) was a product of the SAL Salt of the Atlantic and the ECOSAL Atlantis EU-funded projects. The founding members of the STRA are 12 institutions, representing 21 (former) traditional salt making sites with a consolidated visitor programme and a sensitivity towards heritage protection. Among the partner institutions, there are public local and regional authorities –with different scopes of action, such as heritage, tourism, European funds, environment or culture-, salt producers, universities and research centres, museums and not-for-profit organizations (see Figure 4.2).

Some of these institutions are not linked to any site in particular, but act as coordinators of a certain group of sites or are experts in salt heritage in general.

The goals of the Route are to enhance a sustainable form of tourism in the partner sites and to promote the exchange of expertise and know-how between the sites. Traditional salt making is the common thread of all sites involved, whether they are still active or not, and special attention is paid to the protection of their natural and cultural heritage. A prerequisite to become a member of the route is to have a proactive attitude towards heritage protection and its dissemination via tourism. Hence, the existence of some form of coordinated efforts to preserve the site and an organised visitor programme is needed. Although the Route has been originally designed with a top-down approach, it is now up to the partners how to develop it. In this respect, the route is open for new partners to join.

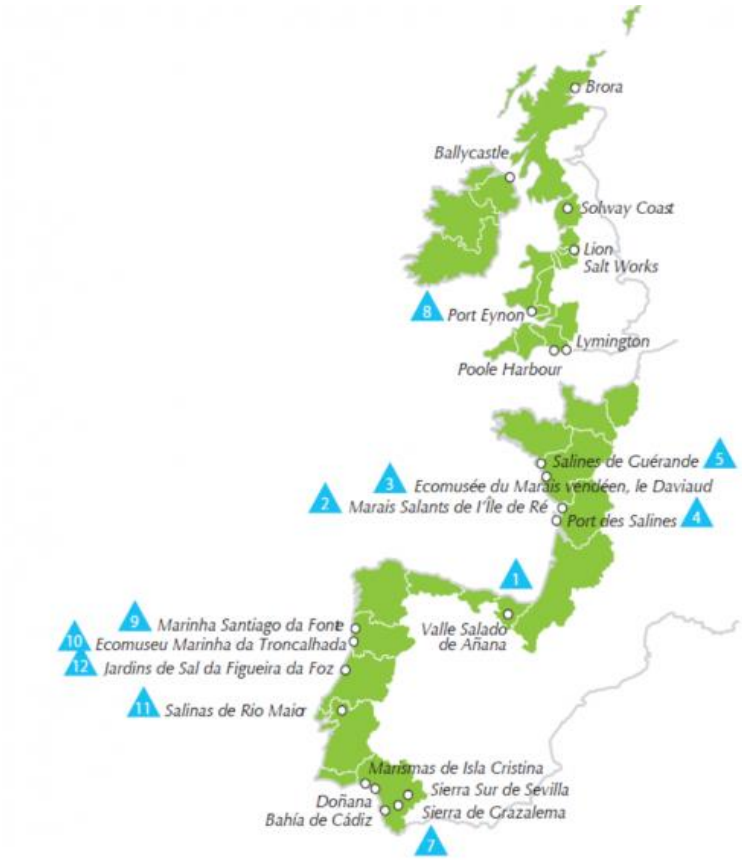


Figure 4.2: Map of the founding members of the Salt Traditional Route of the Atlantic during the ECOSAL Atlantis project (Source: http://ecosal-atlantis.ua.pt/)

Alte Salzstrasse – Old Salt Road

More than 1,000 years ago an important long-distance trade route went from the North Sea to the Mediterranean; crossing the so called Ore Mountains, on the border between Saxony and Bohemia. This route led from the Old Viking town Haithabu to Lüneburg via Lübeck continuing via Magdeburg, Halle and Leipzig to Waldheim. From that point the Old Salt road crossed the Ore Mountains, from Oederan and Sayda to Prague via Brüx and continued to Venice and, originally, Istanbul. On this route, goods such as coats, amber, silk and jewelleries, but also slaves, were traded. Years later they it specialised in hauling salt from the mines of Halle into all neighbouring regions and countries. This Old trade road used mule

tracks (a.k.a. bohemian paths) through the Ore Mountains. Already more than 100 years ago, many communities in the Ore Mountains became interested in a touristic use of the trade route, the so called Old Salt road. The modern version of the Old Salt Road now traverses Europe from north to south almost with a straight line, joining (former) salt making sites and trading posts. The road is advertised to visitors at local scale.

Figure 4.3: The Old Salt Road with its main centres of attention in Germany, Czech Republic, Austria and Italy (Source: http://www.alte-salzstrasse.de)

Other initiatives

Some other efforts have been made to create networks around salt heritage and/or its natural values. As an outcome of the ALAS All About Salt Final Conference celebrated in Mytilene (Greece) in 2002, the international wetland organization MedWet launched the Network of Mediterranean Salinas, an informal group of people and institutions devoted to the protection of salinas in the Mediterranean basin. The network never really got from the ground (pers. obs.). In 2006, the Museo del Mar y de la Sal in Torrevieja (Alicante, Comunitat Valenciana) proposed the creation of a network of European Salt Museums, without known success. In Spain, after a conference on salinas and snow pits celebrated in Odèn (Lleida, Catalonia) in 2007 a Franco-Spanish network of inland salinas and ice and snow pits was created. The network met a few times but never attained a lasting, international success. A few years later, in 2010, the Municipality of Cervià (Italy) launched a call for members for a network of Salt Cities, also without known response. Later, in 2014, the Institute of Salt Heritage and Saltscapes, IPAISAL, offered traditional salt makers from Spain and Portugal to participate in the Network of Iberian Traditional Salinas (RIST), which is currently under formal creation. Hence, there seems to be an interest in sharing experiences and expertise among different stakeholders, but it remains to be analysed why so many initiatives die off so soon.

Labels and certifications

Salt production laws and protection instruments

An indirect way to preserve traditional saltscapes is to protect the artisanal salt that is produced in them. Despite recent legislative efforts (*Real Decreto 1634/2011* in Spain; *Decreto-Lei n.º 350/2007* in Portugal or *Décret no 2007-588* in France), little is regulated about what makes a salt artisanal, traditional or hand-harvested, except when described by labels based on voluntary agreements (Nature et Progrès 2005) or by professional entities (Association Française des Producteurs de Sel Marin de l'Atlantique Recolte Manuellement 2008, Necton 2006). Salt manufacturers and distributors are thus free to label their salt as *artisanal* or *traditional* if they feel like doing so. Often, they offer true but incomplete or vague information, thereby risking to mislead the customer. Examples of this are salts that label themselves *natural* because they have been obtained in a natural protected area, but in fact are refined as many others. Other salts sell themselves as *fossil* (i.e. originating from a sea that dried millions of years ago) as a guarantee of being free from pollutants, but this is the case of most salt mines, so there is not much special about that. Yet others label their salt as *organic*, salt being, ironically, an inorganic compound by definition. With respect to its geographical origin, commercial food-grade salts in Spain are forced to state the registry number of the packaging company (*R.D. 1424/1983 del 2 de abril por el que se aprueba la Reglamentación Técnico-Sanitaria para la obtención, circulación y venta de la sal y las salmueras comestibles*) but nothing needs to be said about where the salt itself comes from; neither whether it is sea, mine or spring salt and how it has been harvested.

Another means to protect the salt is recognising its region of origin by means of legally binding instruments. In Europe, five artisanal salt making areas have registered or are in the process of registering their salt under protected designation of origin (PDO), namely Anglesey Sea Salt / Halen Môn in the UK, Piranska sol in Slovenia, Sal de Tavira / Flor de Sal de Tavira in Portugal, Sale Marino di Trapani in Italy and Sel de Guérande / Fleur de sel de Guérande in France. However, this measure does protect the salt but not the landscape or the method of production.

Brand "Parque Natural"

Also, some Spanish regional nature protection authorities (Andalucía, Junta de Castilla y León, Comunitat Valenciana…) have created the brand *Parque natural* (natural park), to be applied to products and services offered or produced within natural protected areas, with the aim to enhance the development of local businesses in these areas and protect the productive landscapes. Paradoxically, only industrial salt from the Bay of Cádiz and Cabo de Gata (Andalucía) and Torrevieja (Comunitat Valenciana) have been registered with this brand.

Slow food

Slow Food was started in the 1980s with the initial aim to defend regional traditions, good food, gastronomic pleasure and a slow pace of life. In over two decades of history, the movement has evolved to embrace a comprehensive approach to food and other areas of life (education, living…) that recognizes the strong connections between plate, planet, people, politics and culture. Today Slow Food represents a global movement involving thousands of projects in over 130 countries. A daughter project within the Slow Food

movement is *Terra Madre*. It was conceived to protect and support small-scale producers. It thereby contributes to raise awareness of the value of their work, and provide them with the tools needed to be able to work in better conditions (Slow Food 2016). Over a dozen salt producers have joined the *Terra Madre* network worldwide, of which three are in Europe. All of them practise artisanal or traditional salt making techniques:

- Guérande Salters, France
- Kcna sol producers, Macedonia
- Marais Breton Salters, France

Organic food labels

The European Union Council Regulation on organic food certification is rather clear as to which products are entitled to apply for such a certification. This applies to the following agricultural products, including aquaculture and yeast: Living or unprocessed products, processed foods, animal feed, seeds and propagating material and collection of wild plants and seaweed. Products from hunting and fishing of wild animals are not included in its scope. Although it is not specifically mentioned in the EU regulations, salt as such is not included in the products that can be certified as organic. Paradoxically, processed food and animal feed can be certified, regardless where the salt needed in the respective transformation processes comes from.

To shed some light on this regulatory gap, the US Department of Agriculture allows to label "100 percent organic" any product that contains 100 percent organic ingredients, excluding salt and water, which are considered natural. By defect, thus, all salt is considered "organic".

Given the fact that regular, industrial food grade salt has suffered a refining process and has certain additives (e.g. anti-caking agents), some salt producers are interested in acknowledging the fact that they are selling unrefined, additive-free salt. To this end, certain certification organisms have agreed to design certification standards for salt. Examples of these certificates are *Intereco* (certifies salts produced by industrial manufactures in Spain, nl. Infosa and Salinera Española), *Sativa* (certifies artisanal salt from Tavira in Portugal) and *Ecocert* (certifies salts produced by industrial manufacturers in France, nl. Groupe Salins).

Artisanal salt makers are in the process of joining similar certification schemes. Whenever possible, they resort to the official organic certification regulations in their region. As an example, *Sel des Pyrenées*, produced by hand in Salinas de Oro, Navarra, has obtained the official *Bio* certificate provided by the regional agency in Navarra, CPAEN.

Retailers also offer their own "organic" salts. These are often packaged by distributors specialised in organic products and label salt as such. However, no indication of production method or location can be found in the packaging and the traceability of the salt is severely hampered. These labels are not validated by an external and independent certification organization. Therefore, they have merely a marketing function, rather than informative.

4.4 The management of salinas

The management of a salt making site is a complex issue, given the diversity of tangible and intangible elements involved in the shaping of the saltscapes themselves and the interrelations that exist among them. Artisanal salt making sites need to cope with the usual constraints of any mining activity[52] and its associated trade (permits, concessions, safety and health, quality…). In addition, they must comply with regulations related to nature conservation, river catchment maintenance, environmental impact assessment, etc. If the site is protected, they also should comply with specific laws related to the protection of flora, fauna, built heritage, etc. They also need to combine their original purpose (salt making) with other associated activities that provide enough revenue to keep the business running. Hence, they need to adapt to the needs of a great variety of stakeholders, not all of them necessarily related to salt.

To understand the complexity of the management of a salt making site, it can be set against the backdrop of the three spheres of sustainability discussed in Chapter 2: Social, environmental and economic. With these three categories in mind, this chapter will deepen into the good practices observed with respect to stakeholder participation and decision making processes (social aspects), the planning instruments (environmental aspects) and the funding of recovery projects (economic aspects).

4.4.1 Stakeholders involvement

Salt makers, salineros, paludiers…

Salt making is a human activity and therefore, it requires the specialised contribution of salt makers. They can be considered the most basic and fundamental stakeholder to keep a saltscape alive (see Figure 4.4). This specialised know-how is based on the management of the water to create brine and let it crystalize as salt. It also includes the maintenance of infrastructures, the manufacture and use of tools, the understanding of nature and weather to efficiently use them to the advantage of salt making, etc. Depending on the site and its conditions, salt workers may have a specific role, or may concentrate all this knowledge and tasks on one person. This is usually the case in artisanal salt making sites. Numerous works have described the salt making process and have delved in the role and traditional knowledge of salt makers (e. g. Beltran 1988a, 1988b, 1990, 1991, 1993, 2007, 2008b; Beltran & Farré 2007; Buron 1999, 2000; Carrasco & Hueso 2006c; Delbos 1983; Fuster & Tomás 2008; Lemmonier 1977a, 1980, 1984; Sáiz 1989; Thomson 1999; Torres 1991).

Salt makers are more often than not working for third parties, namely the owners and / or managers of the site. These are often small or medium sized companies, such as the case of Imón in Spain, Læsø in Denmark or Sečovlje in Slovenia. Sometimes the owners are families who have inherited the business from their ancestors, which is the case of Arcos de las Salinas, Espartinas, Peralta de la Sal, part of Poza de la Sal. Occasionally, the salt making site

[52] Salt making in most parts of Europe is considered as a mining activity, even if the salinas are at coastal sites. Only in France and Portugal, under certain conditions, can salt making be considered an agricultural activity. This has large implications with respect the management of the site and the funding via public subsidies. As explained in Chaper 3, it is argued that artisanal salt making implies a management of the water analogous to how farmers work their land, and that from a properly *farmed* brine *grows* good quality salt.

is owned or managed by public authorities. Rambla Salada, for instance, is direct property of the Región de Murcia, and is managed by a local association via a land stewardship agreement. Salinas de Añana or San Juan, are managed by a trust, although the ownership in the first case, is private (a company gathering the former and some new owners) and in the second, public (the municipality). A good coordination and cooperation between owners, managers and salt makers is needed to guarantee the success in the operation and to earn reasonable revenues from the activity. To this end, transparency, confidence and mutual understanding are essential values. In the salinas of Añana, for instance, the trust managing the site, is formed among others by public authorities and the salt makers themselves, thereby ensuring a coordinated management effort. These values are not earned overnight and sometimes long negotiating sessions are needed. This was also there. Even then, situations change, and resilience and adaptation capacity are also needed[53]. After three changes in manangement in Añana since 2009, it remains to be seen how this will result.

Other salt-related activities are the storing, cleaning and packaging of the salt; quality control, marketing, sales, etc. Larger salt making sites will also need to employ workforce, not all of it related to salt making. Managers, accountants, tourist guides, IT specialists, maintenance staff, etc. are jobs associated to these facilities. Many of these employees usually work from an office away from the field and may not ever set foot on the salina itself. Under certain circumstances, other collaborators will be needed, such as architects, ecologists, microbiologists, archaeologists, lawyers, etc. for specific tasks. Other service providers can be used to cover different needs (transportation, materials, catering…).

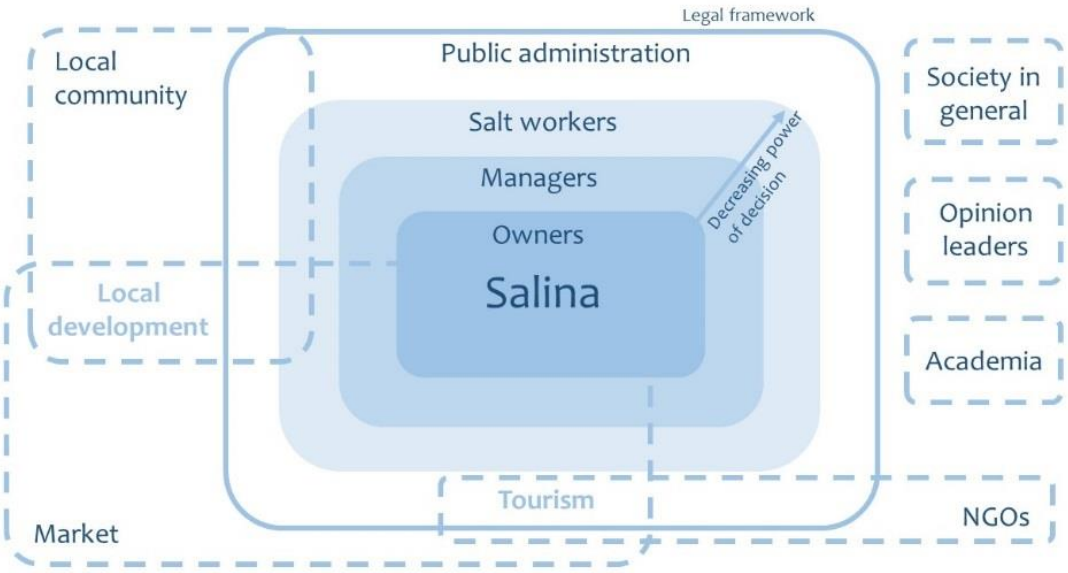


Figure 4.4 Schematic overview of the stakeholders involved in salt making (Source: Own elaboration)

[53] Mikel Landa, the first manager of the *Fundación Valle Salado* in Añana after its creation, gathered these values under one term: "organizational sustainability" (pers. comm.). He insisted on the need to create solid agreements that could resist changes in time.

Very rarely are salt makers themselves owners of the site, except in the case of Guérande and other Atlantic salt marshes in France[54], in isolated salt making sites in inland Spain -such as Gerri de la Sal- or in small coastal salinas in the Canaries, for instance. In these cases, salt makers are sometimes grouped in the form of associations or cooperatives, which have an essential role and will be discussed below. Being an independent salt maker gives of course a great degree of freedom in all decisions concerning the activity. After all, one third of the salt makers of Guérande operate as freelance entrepreneurs, a percentage that gives an indication of the advantages it may have despite the workload it entails. It remains to be seen, however, to which degree these *paludiers* may (indirectly) profit from the fame of their region, substantially enhanced by the marketing efforts of the cooperative and the public authorities. In contrast, the few independent salt makers still operating in Spain, are forced to work solo whether they choose to do so or not. The feel left alone by the public administration and tend to be wary of newcomers. Working as salt maker has a strong component of solitude and the arrival of people interested in this profession can be interpreted as intrusion. Slowly by slowly, some professional associations are growing in Spain and Portugal and the benefits of belonging to one of them are very gradually being seen. A more open and cooperative attitude is also being perceived among the older salt makers.

Professional and other associations

As indicated above, professional associations for the defence of the interests of salt makers are arising in all salt making areas. Table 4.8 offers a list of them at European scale, although most of them operate at local or national level. France is perhaps the most active country in that respect, with the longest tradition of gathering professional *paludiers*. The *Association pour la Promotion du Sel Artisanal* (APROSELA) succeeded with the protection of the salt of Guérande and the *Associação de Produtores e Marnotos da Ria de Aveiro* (APMRA) and *TradiSal* from Castro Marim, in Portugal are trying to register the artisanal salts from Aveiro and Algarve, respectively. In Spain, professional associations such as the the *Asociación de Productores de Salinas Marinas Artesanales de Canarias*, the *Asociación Andaluza de Artesanos de la Sal* (ANDASAL) and the *Asociación Mallorquina de la Sal* (AMASAL), are local or regional entities negotiating with their authorities of reference to register theirs. Little is known about the efforts by the national entity *Asociación Española de Salinas Marinas Artesanales*, created in 2007 or its European counterpart, the *Fédération Européenne de Producteurs de Sel Marin Récolté Manuellement* to gain recognition on artisanal salts as a whole. Most of these associations are open only for salt makers and are devoted to the acknowledgement of their salt as an artisanal, high quality, agricultural product, with a restricted geographic origin.

Other associations represent the industrial salt making companies at industrial scale and focus on legislation that affects industrial salt (use of chemicals, health issues or the use of road salt for de-icing, for instance). This is the case of EuSalt in Europe, or The Salt Institute, at international level, plus other national entities, as shown in Table 4.8.

On the other hand, there are a number of associations interested in a broader concept of salt making, that is, in *saliniculture* as a whole. These associations tend to welcome anyone interested in salt and other issues they may defend (local culture, nature, other forms of heritage…), such as the *Jurade de Sel* in Salies de Béarn or *Associazione per il Parco Molentargius Saline Poetto* in Italy. Others operate at a larger geographical scope, such as

[54] The salt marshes of Île de Ré and Noirmoutier have followed the example of Guérande in many ways, notably with respect to the organization of the salt workers.

IPAISAL. However, they are usually seen as cultural or environmentalist groups with little or no influence in the salt making activity itself. Few exceptions exist, though: The *Asociación de Amigos de las Salinas de Poza* in Spain, has reached an agreement with the municipality of Poza de la Sal, which allows them not only to recover the Granja de Rusalado (the portion of salina owned by the municipality), but also to produce and sell salt there. Many other local associations exist in salt making areas, which support the culture and heritage of their municipalities, but are certainly not specialised in this activity. Examples are *Asociación La Carraca* near Rambla Salada or *Asociación La Sabina* in Arcos de las Salinas. These entities can play an important role in the promotion of tourism, as they are willing to share their knowledge on local heritage at a low to zero cost for the authorities.

Table 4.8: Organizations related to salt making in Europe

Name	Location	Scope of action
Associations of salt producers		
Associação de Produtores e Marnotos da Ria de Aveiro (APMRA)	Portugal	Local
TradiSal	Portugal	Local
Coopérative Les Salines de Guérande	France	Local
Cooperative de Sauniers de l'Île de Ré	France	Local
Société AQUASEL – Cooperative de Sauniers de l'Île de Nourmoutier	France	Local
Gatzagak S.L.	Spain	Local
Association pour la Promotion du Sel Artisanal (APROSELA)	France	Regional
Asociación de Productores de Salinas Marinas Artesanales de Canarias	Spain	Regional
Asociación Andaluza de Artesanos de la Sal (ANDASAL)	Spain	Regional
Asociación Mallorquina de la Sal (AMASAL)	Spain	Regional
Associazione Saline e Natura	Italy	National
Fédération Européenne de Producteurs de Sel Marin Récolté Manuellement	France	European
Industry		
AFASAL / Asociación Ibérica de Fabricantes de Sal	Spain	National
Verband der Kali and Salzindustrie	Germany	National
Salt Association	UK	National
Saltsense	UK	National
Comité des Salines de France	France	National
Instituto de la Sal	Spain & Portugal	Bilateral
EuSalt	Belgium	European
Salt Institute	USA	International
Heritage, culture and tourism		
Asociación de Amigos de las Salinas de Poza	Spain	Local
Jurade du Sel de Salies de Béarn	France	Local
Læsø Saltsyder Laug†	Denmark	Local
Associazione per il Parco Molentargius Saline Poetto	Italy	Local
ECOSAL-UK	UK	National
Xarxa Euroregional de pous de glaç i salines de muntanya†	Spain & France	Bilateral
Association STRA – Traditional Salt Route of the Atlantic	France	European
MedWet Salinas network†	Greece	Mediterranean
IPAISAL / Asociación de Amigos de las Salinas de Interior	Spain	International
Academic		
Commission International d'Histoire du Sel†	Germany/France	International
Gesellschaft zur Erforschung der Salzgeschichte e. V. (GES)	Germany	International
International Society of Salt Lake Research (ISSLR)	USA	International

†Inactive or extinct. Source: Own elaboration

Another group of associations are those devoted to the research on salt from many different disciplinary perspectives. Most well-known are the *Commission International d'Histoire du Sel*, now extinct, and the International Society of Salt Lake Research, interested in salt history and limnology, respectively. Many other scientific societies exist with a relative interest in the study of salt. Table 4.9 summarizes the most relevant ones at international level.

Table 4.9: Scientific societies indirectly interested in saltscapes and salt heritage

Name	Scope of interest	Scope of action
International Committee for the Conservation of the Industrial Heritage (TICCIH)	Industrial heritage	International
Europa Nostra	Cultural heritage	European
Industria, Naturaleza, Cultura (INCUNA)	Industrial heritage	Iberia / America
Sociedad Española de Historia de la Arqueología (SEHA)	Archaeology	Iberia
Sociedad Española para la Defensa del Patrimonio Geológico y Minero (SEDPGYM)	Geological heritage	Iberia / America
International Association for Landscape Ecology (IALE)	Landscape	International
Ramsar Culture Network (RCN)	Wetlands	International
International Society of Limnology (SIL)	Wetlands	International
World Wetland Network (WWN)	Wetlands	International
Wetlands International	Wetlands	International
International Society for Extremophiles (ISE)	Microbiology	International
BirdLife International	Birds	International
Mediterranean Institute for Nature and Anthropos (MedINA)	Wetlands, nature	Mediterranean

Source: Own elaboration

These associations have a broader scope of interest but welcome salt researchers and their work. They are an important source of information on salt heritage, which allows the understanding of past and present events and give a strong background information for recovery projects. However, these entities are seen as strictly academic and are seldom taken into account as stakeholders in decision making processes regarding the management of salt making sites.

Public authorities

Authorities have a very relevant role in the management of saltscapes and salt heritage. Not only as owners or managers of the salt making sites, which is a minor role, but as the entities responsible for the legislative framework that affects daily life in these sites. Authorities can operate at different geographical levels (local, county, province, region, state, national, European, international…) and sectorial scopes (agriculture, mining, industry, nature conservation, culture, etc.). The relevance of each level or scope will depend on the weight of each entity, determined by the tradition of policy making in each area, and the heritage values of each site. As an example, the management of the Rambla Salada site has a strong influence from the regional nature conservation authorities, whereas the department of culture and the municipality follow behind. The contrary happens with Salinas de Añana, a site in which the environmental authorities have had a minor say until very recently. In some cases, authorities of equal geographical level but different sectorial scopes may offer conflicting guidelines to the site. Typically, nature conservation and agriculture measures are not always in line with each other. In Spanish coastal salinas, the *Ley de Costas* (Coast Act) declares a fringe of 100 metres[55] along the coast as public property, thereby directly interfering with the management of coastal salinas, of private property, which necessarily include a part of this fringe. In inland salinas, similar controversies arise with the authorities responsible for river catchments, whose territory does not overlap with the regions and do not necessarily share common criteria. In order to avoid contradiction between guidelines and regulations, it is essential to promote an open dialogue between the parts. In the salinas of San Juan, for instance, the authority in charge of their recovery (the former Ministry of the

[55] This is in fact a very complex and controversial issue and its proper analysis goes beyond the scope of this work. Suffice to say that private properties may request an authorization to invade the zone of coastal protection, under certain circumstances, but it is not always granted and tensions persist.

Environment) called all possible stakeholders to different meetings in order to achieve the best possible consensus. Among the stakeholders were regional and local authorities, cultural associations, scientists and technicians. Today, the salina has been recovered and is functioning reasonably well.

The local community and beyond

The local community is usually neglected in salt making recovery projects. Unless a public participation process is opened (more on this below), only stakeholders directly related to the activity are invited. In order to participate actively, residents need to join one of the organisations related to salt making, usually some association, or as council members. At the most, residents are invited to a presentation of a recovery plan or the results of a certain action. This has been the case, for instance, with the public presentation of the Master Plan of the Salinas of Poza de la Sal, in 2006, or the recovery plan of the Chapel of the Virgen de los Dolores in Arcos de las Salinas, in 2015. On the other hand, the valley of the Salado river near Sigüenza has been subject to public attention in the past few years. First, during the environmental impact assessment of the construction project of a new industrial salina near Imón in 2012, later with the public participation processes of the Natura 2000 management plan for the site "Valle y salinas del Salado" and the diagnose of the *Destino Turismo Sostenible* (Sustainable Tourism Destination) for Sigüenza in 2016. It remains to be seen whether these efforts actually involve an improvement of the Imón salt making site, already in a delicate situation.

Neglecting the local community may have an adverse effect on the products and services provided to the salt making activity and /or to visitors. Until very recently, in Salinas de Añana there was no permanent restaurant and accommodation was hard to get by. There was no strategy to promote entrepreneurship by local or regional authorities, which would support the strong investments in the recovery of the salt making site itself. On the positive side of things, in Læsø, the salt making company tends to prefer local providers of services (maintenance, packaging…) even when their prices are not so competitive, as a gesture to let the revenues stay on the island.

Visitors, on the other hand, are seldom acknowledged. Some sites perform quality assessment by means of standard questionnaires that hardly reflect the individual needs of travellers and focus rather on the average parameters of the local tourism market. However, visitors may have a multiplier effect on other visitors, if their experience was positive, but will tend to express their opinion more eagerly, if the experience was negative. Tourism authorities also wish to attract repeated visits. The programme "Open for renovation" is a successful initiative that is still going on in Salinas de Añana and promotes repeated visits. On the other hand, in Guérande, the tourism managers of the cooperative, have clearly focused on families, small groups and couples instead of attracting large groups. Visitor numbers may not be as high, but these visitors tend to spend more money on site.

A group that falls in between residents and visitors is that of temporary residents, usually summer dwellers. They tend to be overlooked by public authorities and managers. Even though they feel a sense of belonging similar to that of residents, their standpoints may differ from them and may be more akin to that of visitors.

Another group easily looked over are opinion leaders. In rural areas, these are often hidden from sight, as they do not always belong to a formal organisation or, in case they do, it seems

far from the issue of interest. Typically, these people can be found in hunter clubs, parish groups, women's associations or simply are natural leaders easily detected at gatherings in public spaces such as bars, squares or even churches. The role of informal opinion leaders should be taken into account, as they can exert enormous influence on the opinion, apparently neutral, of many residents, often following their personal interests rather than the wellbeing of the community. To illustrate this, in Læsø, a referendum was made to decide whether the island wanted to apply to become a national park. A few active opinion leaders managed to tilt the result to their favour: *no*. They feared that the new protection status would affect their personal livelihoods.

Opinion leaders can be found beyond the local community, too. Journalists, bloggers, sportsmen and other people well-known by the general public can contribute to the visibility of a site. In Salinas de Añana, the Fundación Valle Salado has traditionally collaborated with Michelin-awarded chefs, who use this salt in their restaurants and other public venues. These chefs also symbolically sponsor individual crystallisation basins, which are appropriately signposted, so that visitors can see which chefs and restaurants support the salt from Añana. In Poza de la Sal, the well-known Spanish naturalist and broadcaster, Félix Rodríguez de la Fuente, born in this village and deceased in an air crash in Alaska in 1980, has become a local icon. The local authorities try to attract nostalgic visitors to Poza by making use of the relevance of this public figure.

4.4.2 Planning instruments

Protection and planning are two key instruments for the conservation of heritage assets. While the first offers a legal and conceptual framework for their protection, the second provides guidelines for the actual, day-to-day conservation. The effective management of cultural and natural values requires careful planning, especially if the site has a legally binding protection status. Planning can be done at different levels and with varying degrees of detail. The most general plans are related to territorial and urban planning, and can be understood from different perspectives (to organise the activities in a certain territory; to increase the efficiency in the use of resources; to comply with sectorial laws and regulations and to control the uses of the land to prevent its misuse or depletion) (Fernández *et al.* 2007).

Ideally, a proper territorial planning, translated into local urban plans, should take all of this into account. However, the perspective of territorial planning does not enter into sufficient detail as to the management of heritage, since it simply decides if it should be protected or not and in which sector it can be used (tertiary, productive…). Urban and territorial planning is also subject to regional strategies and laws, so it can vary from one site to the other and therefore will not be subject of study within the context of this work. For a thorough analysis of territorial planning around salinas, please consult Emilia Román's doctoral dissertation, focused on the case of Andalusia (Román 2014).

More detailed and of interest within this context are site-specific plans. They can roughly be divided into two groups, those devoted to nature conservation as a tool to manage protected areas, and master plans, typically used for the management of cultural tangible heritage. Table 4.10 shows the most relevant planning instruments for the study sites discussed. It also indicates the institution leading the process of patrimonialisation as well as the level of public participation attained during the preparation of the plan (see also Table 4.4).

Table 4.10: Most relevant planning instruments in the study sites

Site	Most relevant planning instrument	Driver of patrimonialisation process	Level of public participation
Spain			
Añana	Master Plan	Provincial admin.	Consultation
Arcos de las S.	None	Local admin.	None
Espartinas	None	Local admin.	None
Gerri	Obsolete proposals	Local admin.	Information
Imón	Master Plan (obsolete)	Regional admin.	None
Peralta	In preparation	NGO / Local admin.	Consultation
Poza	Master Plan	NGO / Local admin.	Information
Rambla S.	PORN[1] Ajauque y Rambla Salada	Regional admin.	Active participation
San Juan	Natura 2000 integrated management plan (draft)	Local admin.	Information
Rest of Europe			
Guérande	Natura 2000 integrated management plan	NGO	None
Læsø	Natura 2000 integrated management plan (draft)	Local admin.	Information
Sečovlje	Natura 2000 integrated management plan	National / Local admin.	Information

[1]*Plan de Ordenación de los Recursos Naturales* (Natural Resources Regulation Plan)
Source: Own elaboration

Public participation

Planning processes involve the participation of stakeholders and the wider public. Hence, this section will devote a few words on stakeholder engagement and public participation, within the context of territorial planning. Stakeholder engagement can be defined as the "active involvement and participation" of any person or group who influences or is influenced by the planning process (Durham *et al.* 2014). Stakeholder engagement can provide a number of benefits, both for the stakeholders themselves as for the wider society. These benefits include an increased empowerment; improved links and partnerships; access to additional resources or information; endorsement for an approach or decision; better communication, awareness, trust and support; and improved learning through sharing of experiences. There are different levels of engagement, according to the degree of involvement and the capacity to decide that is granted. Although many classifications exist, a simple model is offered in Figure 4.5, with three basic levels: Information, consultation and active participation. The first level is the most basic, with little involvement and little risk of discussion and conflict for the managers. The consultation level provided voice but not a vote to stakeholders. They may express and opinion, but the final decision is on the managers. Active participation, on the contrary, may provide equal opportunities for decision making to all stakeholders invited. There is more risk of shifting management goals, but also more chances for consensus and acceptance.

At this level, "engagement can assist in managing risks and reducing conflict by identifying barriers, limitations and potential negative outcomes before they occur. Well-managed engagement activities can facilitate learning, build trust between participants and help mediate conflicts" (Durham *et al.* 2014, see also Heras 2003). Planning processes can highlight latent conflicts and some stakeholders fear that the declaration of a protection instrument or the implementation of a plan, can constitute a barrier to their livelihoods.

Hence, stakeholder engagement is especially relevant in this context (Eagles *et al*. 2003, EUROPARC-España 2008, Íñigo *et al*. 2010).

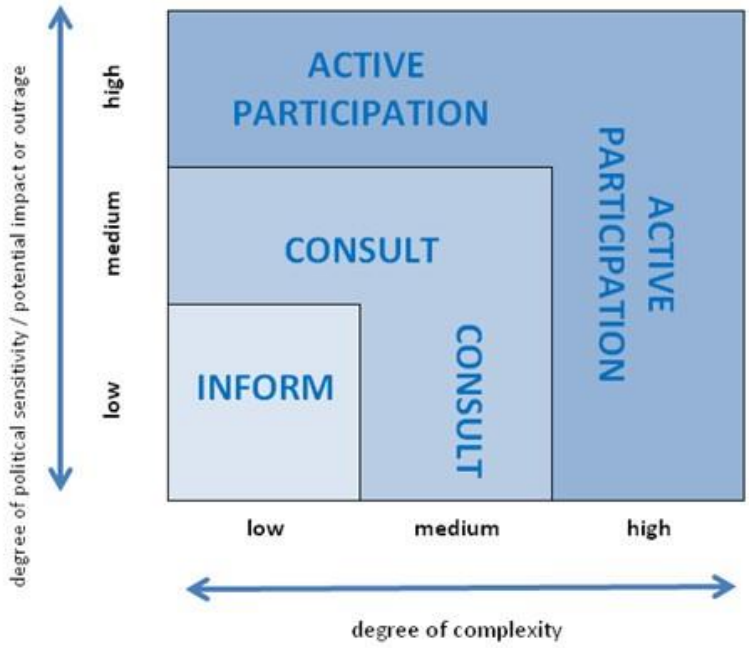


Figure 4.5: Levels of stakeholder involvement
(Source: ©International Association for Public Participation)

The role of Master Plans

A very useful tool to facilitate global understanding of a territory and manage its elements, is the Master Plan. It is a planning figure that intends to act as a guide to define the status of a site or territory and point to where and how they want to move there, in a coordinated and integrated manner. This is an instrument that combines previously existing planning documents; it tries to soften those edges or conflicts that may arise between them and fill the gaps that may remain undefined, when determining the future of that site or territory. A master plan is developed with an interdisciplinary perspective to achieve greater and better knowledge of the landscape from all possible angles. These documents should be defined and specified the complete documentation of their current status, as well as procedures and strategies in support, organize and regulate the proposed conservation actions, adaptation, improvement, use and maintenance. A master plan is not binding, but has great power due to its high specificity and detail. Thus, a master plan should at least:

- Provide a complete and integrated diagnosis of the territory
- Mark a roadmap by defining a mission, a vision and objectives
- Defining strategic lines of action by major areas of interest
- Advise on the technical, human and financial resources and obtaining
- Design of continuous assessment mechanisms for verifying correct or change course

As mentioned before, a master plan has a multidisciplinary approach that enables collating different approaches and interests. Essential in this process is the participation of the local community, which should be considered as protagonists of their own future. However, master plans have in the past often been designed and implemented from above, without

much consideration for the local community, let alone their participation. These plans stem from a monumentalist vision of heritage. The local community on the other hand, perceive them as a document that does not attend their needs and daily concerns and do not feel identified with it. Many of these plans are based almost exclusively on tourism as an economic support of their actions, without regard to other productive aspects that can offer the territory. Thus they bet on a single source of income, which is not always as profitable as expected and constituted a factor of weakness for the site. To this must be added the huge administrative complexity, both sectorial and geographical, which does not contribute to an ideal flow of information between those involved. However, more recent models of Master Plans are slowly evolving into a more participatory experience and incorporate the needs and vision of the local community. In Spain, there are three master plans for salt making sites: Salinas de Añana, Poza de la Sal and Salinas de Imón. They will be further commented in Chapter 5.

Natural protected area planning

There is no overlapping model for planning natural protected areas at European scale. The Habitats Directive 92/43/CEEE states that Natura 2000 sites need to establish conservation measures, that can be implemented via management plans. These constitute a framework of reference for specific conservation measures and activities allowed within any given natural protected area within the Natura 2000 network. These may be combined with other types of management plans, as allowed by each member state (European Communities 2000). Specific guidance can be found for different sectorial activities taking place within Natura 2000 sites, such as salt making (European Communities 2010). The LIFE MC-SALT project (see below) has prepared a management model for saltworks belonging to the Natura 2000 network[56].

The Spanish Act for Natural Heritage and Biodiversity (*Ley 42/2007, de 13 de diciembre, del Patrimonio Natural y la Biodiversidad*) establishes two main planning instruments, that may be relevant for those saltscapes inserted in natural protected areas (Martínez & Martín 2003): Natural Resources Management Plan (*Plan de Ordenación de los Recursos Naturales*, PORN) and Master Plan of Use and Management (*Plan Rector de Uso y Gestión*, PRUG)[57]. The role of PORN consists in establishing a framework of reference within the natural protected area as well as in relation to the local urban planning and the development of sectorial activities. In relation to the rest of planning instruments, the PORN has a leading position and its compliance is mandatory. On the other hand, the PRUG regulates the uses and activities within the natural protected area, as well as zonation and specific regulations for each zone. Both may have overlapping functions and are not always clearly separated (EUROPARC-España 2008, Tolón & Lastra 2008).

[56] Unpublished at the time of writing (January 2017). A general presentation of the model can be found in http://www.mc-salt.eu/en/documents_28c11.html [Retrieved January 2017]

[57] The autonomous regions in Spain have a certain degree of independence in defining planning instruments. For instance, Andalusia has an additional instrument: the Sustainable Development Plan (*Plan de Desarrollo Sostenible, PDS*), which incorporates a socioeconomic dimension to the activities of the protected area (EUROPARC-España 2008).

Tourism planning

One of the most important planning instruments for heritage sites are tourism plans (Wight 2002). Again, there is no unified planning instrument at European level. In Spain, the Government launched in 1996 the so called Tourism Dynamization Plans (*Planes de Dinamización Turística, PDT*). These aim at promoting the tourism resources of sites with a relevant historical, cultural or natural heritage but with limited tourist use. PDTs enhance tourism in a given area by the design of marketing strategies, the integration of business activities and the innovative and rational use of resources. PDTs are often implemented in rural areas and they bear a strong relation to cultural landscapes and protected areas.

Other sectorial plans may be of relevance for saltscapes, such as forestry plans, mining plans, hunting management plans, hydrological plans, etc. The multifunctional nature of these landscapes make them very complex from the point of view of regulation and the sectorial authorities do not necessarily take these often-overlapping instruments into account. To this end, a multidisciplinary vision, that also considers the voice of the local communities and other stakeholders may be helpful. Some authors refer to this type of instrument as *holistic planning* (Kohl & McCool 2016).

4.4.3 Funding

The conservation of natural and cultural heritage, with or without legally binding instruments, has one large limiting factor: funding. The financial support for the conservation of natural and cultural heritage assets has traditionally come from single-administration public funds. However, this has changed over the past decades and public and private institutions have designed different funding instruments and strategies that can ease the burden of the costs of conservation. This may include the combination of diverse public funds (from different administrative levels or sectors) or enhancing public-private partnerships (Crespo 2002). Table 4.11 summarises several mechanisms.

Some funding instruments have a global scope, which means they can be applied anywhere, without geographic limitation. Some of them are led by the authorities (such as PES or habitat banking; see Table 4.11) with a very limited distribution and very much focused on the conservation of nature. Other global funding strategies are led by private institutions, and, as such, are more flexible in their design and implementation. The connection between the sponsor and the beneficiary is direct (e.g. crowdfunding, direct sponsorship or adoption schemes). European and national authorities have also provided monetary resources in the form of subsidies, grants and funds. In many cases, these are granted based on co-financing, which ensures a certain degree of commitment from the beneficiary and the need to seek alliances with other stakeholders, strengthening the links among them. An indirect form of funding is the possibility of obtaining tax reductions or exemptions from certain activities or for the maintenance of certain types of heritage. These tax incentives are applied sparsely and irregularly and are prone to political change. Finally, typical from anglo-saxon culture is the use of revenues from lotteries and similar games for heritage recovery purposes.

However, the mechanisms described in Table 4.11 are support instruments, with a short time span and therefore, limited efficiency. Perhaps the most solid funding mechanism is considering these as an investment rather than a donation, just like natural or cultural values are considered capital assets (Garrod *et al* 2006). A long-term planning of the uses natural and cultural heritage will have and the potential revenues that can be obtained from them,

contribute to the elaboration of a realistic investment plan, with an adequate time frame and the possibility to react to shifting political and economic situations. The planning instruments discussed above often lack a detailed investment plan, with specific figures and investors. Of course, investments should be made considering the social and conservation needs of heritage, to preserve its values on the long run. While deteriorated sites have difficulties attracting funds, a well-preserved site will more easily promote investment; hence the vicious circle of decline can be transformed into the virtuous circle of recovery (Bowitz & Ibenholt 2009, Greffe 2004).

Table 4.11: Funding instruments for the benefit of natural and cultural heritage conservation

Instrument	Scope	Policy focus	Provided by	Brief explanation
Pay per environmental services (PES)[1]	Global	Nature	Public administrations	A mechanism to translate external, non-market values of the environment into real financial incentives for local actors to provide environmental services (ES).
Habitat banking[2]	Global	Nature	Private land owners and organizations	A market where the credits from actions with beneficial biodiversity outcomes can be purchased to offset the debit from environmental damage.
Crowdfunding[3]	Global	Any	Private individuals	Collective cooperation of people who pool their money and other resources together to support efforts initiated by others.
Sponsorship[4]	Global	Any	Private institutions or individuals	Sponsorship is the payment of money by a business to an organisation for the purpose of promoting the business name, products or service.
Wildlife and habitat adoption schemes	Global	Nature	Private individuals	Monetary gift destined to the symbolic adoption of a species or habitat, generally used to support the activities of a conservationist NGO.
EU funds (Life, Interreg…)	European	Nature / culture / tourism	Public administrations	Transnational multi-partner projects with a certain degree of co-funding, usually rather complex from the administrative point of view
Tax incentives[5]	National	Nature / culture	Public administrations	e.g. VAT deduction, reduction in the taxes on property transmission rights…(depending on regional and national laws)
Lotteries and games	National	Nature / Culture	Private individuals	A percentage of the profit is devoted to conservation projects. e.g. Heritage Lottery Fund (UK), *Nationale Postcode Loterij (*The Netherlands)
Project-based subsidies	National /regional / Local	Any	Public administrations / Private organisations	Funding provided as a result of a selection process, in response to a call for projects launched by private foundations, cultural and nature protection administrations, trustee savings banks…
1% cultural	Spain	Culture	Public administrations	Compensatory measure established by the Historical Heritage Act *16/1985*, obtains funds from large public works located near heritage assets

Sources: [1]Engel *et al.* (2008), [2]Dickie & Tucker (2010), [3]Oomen & Aroyo (2011), [4]Javierre (2013), [5]Barreira (2010) & López *et al.* (2010b), own elaboration

Few of these instruments have been applied to the recovery of saltscapes and salt heritage, with the exception of EU funds. These shall be discussed in further detail below. The main sources of funding for the study sites are detailed in Table 4.12. There is a great diversity of public and private sources, the geographic scope of the funding body and, in most cases, a combination of sources has been proven useful.

Table 4.12: Main sources of funding for the study sites

Site	Funding instruments	
	Public	**Private**
Spain		
Añana	EU funds Project-based subsidies 1% cultural Public budget	Project-based subsidies Sponsorship
Arcos de las S.	None	None
Espartinas	None	None
Gerri de la Sal	Public budget	Personal investment
Imón	Project-based subsidies	Project-based subsidies Private investment (unintended)
Peralta	Project-based subsidies Public budget	Private investment
Poza de la Sal	Project-based subsidies Public budget	Project-based subsidies
Rambla Salada	EU funds Project-based subsidies Public budget	-
San Juan	Project-based subsidies 1% cultural Public budget	-
Rest of Europe		
Guérande	EU funds	Private
Læsø	Project-based subsidies	Private
Sečovlje	EU funds Public budget	Private

Source: Own elaboration

EU-funded projects

European funds have significantly contributed to the improvement of salt heritage. In this section, the four main transnational EU-funded projects on salt heritage will be discussed. The first, known by its acronym ALAS, was supported by the Phare programme, another one (MC-Salt) used the LIFE strand and the other two (SAL and ECOSAL Atlantis) were co-financed by the Interreg Atlantic Arc programme. Three of these were shared by some of the study sites, namely: ALAS (Sečovlje), SAL (Añana, Guérande) and ECOSAL (Añana).

ALAS All About Salt (2000-2002)

The Phare programme was one of the three pre-accession instruments financed by the European Union to assist the applicant countries of Central and Eastern Europe in their preparations for joining the European Union. The ALAS "All About Salt" project had as a main goal to promote salinas as poles for local development. As a result, it produced a number of documents related to salt heritage management and guidelines were proposed for the creation of salt museums. The project also involved the improvement of one salt museum (Maritime Museum in Piran, Slovenia) and the creation of three additional ones (the Salt Museums of Polichnitos in Greece, Figueira da Foz in Portugal and Pomorie in Bulgaria).

SAL Salt of the Atlantic and ECOSAL Atlantis projects

On the other hand, the Atlantic Area Programme of the Interreg community initiative has aims at achieving significant and tangible progress in transnational cooperation geared towards cohesive, sustainable and balanced territorial development of the

Atlantic Area and its maritime heritage. The Atlantic Area covers the entire territory of Ireland and the Atlantic regions of Spain, France, Portugal and the United Kingdom. This programme has co-financed two large salt heritage projects: SEL and ECOSAL Atlantis.

The *Interreg SAL "Salt of the Atlantic" project (2004-2007)* attempted to promote a specialised form of salt tourism by creating the "Salt Traditional Route of the Atlantic", which was constituted by the 11 salt making sites that participated in the project. It also supported improvements in the salt museums at Figueira da Foz, in Portugal and Ré and Daviaud, in France and contributed to the creation of salt museums in Aveiro, Portugal and Salinas de Añana and Fuerteventura, Spain (Hueso & Carrasco 2008a). Alas, the route did not develop any further beyond the scope of the SAL project and had to wait until the end of ECOSAL Atlantis to gain some momentum.

The main objective of the *"ECOSAL Atlantis" project (2010-2013)* aimed at the development of a joint, integrated and sustainable tourism based on the cultural and natural heritage of traditional Atlantic salt making sites. The project focused on three key issues to develop tourism in Atlantic saltworks: heritage, territorial development, and biodiversity and ecotourism. One of the tangible results of the project is the revival of the "Salt Traditional Route of the Atlantic". The route was then redefined and redesigned, to host new members and to allow swift action.

Project MC-SALT LIFE10 NAT/IT/000256 Environmental Management and Conservation in Mediterranean Saltworks and Coastal Lagoons (2011-2016)
The project originated from the results of LIFE00NAT/IT/7215 on the Comacchio salt works, and clustered together Natura 2000 sites' managers who were facing similar conservation issues. The common feature of the Natura 2000 sites involved into the project was that they hosted a (former) salt making site. They were found in different stages of activity, ranging from a production interrupted 25 years ago to still active. The participating sites were Molentargius, Comacchio, Cervia in Italy; Camargue and Aigues-Mortes in France and Atanasovo lake in Bulgaria. The project aimed at preserving the halophyllic habitats and species while maintaining commercial activity. The ecological restoration methods included coastal management practices, removal of invasive species, recovery of infrastructures, construction of breeding sites and mitigation of disturbance from predators.

Other EU-funded schemes

In addition, the LIFE strand of the European Commission's DG Environment has contributed to the conservation of saltscapes and recovery of salt heritage in many different sites. These projects are usually focused on one single site, but sometimes cooperation between sites is also achieved. Details of the LIFE projects in different types of saltscapes are listed in Table 4.13. The study sites have been engaged in many other EU-funded projects. These will be discussed briefly in Chapter 6.

Table 4.13: List of LIFE-funded projects in saltscapes and salinas

Code	Name	Site	Country	Dates	Budget (mill.€)
Coastal salinas					
LIFE93 NAT/E/011200	Conservation and management of wetlands and steppic areas in Murcia	San Pedro del Pinatar	Spain	1994-1996	1,8
LIFE96 ENV/P/000601	Integrated Management Programme for Ria de Aveiro - MARIA	Aveiro	Portugal	1997-1999	0,44
LIFE96 NAT/E/003105	Cerceta pardilla - Coordinated action plan for the conservation of marbled teal in the western Mediterranean region	Santa Pola	Spain	1997-2000	0,59
LIFE97 NAT/F/004229	Oiseaux d'eau - Waterfowl stopovers along the Atlantic seaboard	Guérande / Cádiz	France / Spain	1997-2000	0,74
LIFE99 ENV/P/000673	ESGIRA-MARIA - Integrated Managmeent Structure of Ria de Aveiro : ESGIRA - MARIA	Aveiro	Portugal	1999-2001	0,55
LIFE00 NAT/IT/7215	Comacchio salt works	Comacchio	Italy	2001-2006	1,6
LIFE00 NAT/P/007100	Tagus Estuary's SPA - Recovery of Birds Sanctuaries	Vale de Frades	Portugal	2001-2005	0,46
LIFE00 NAT/E/007304	Cabo de Gata - Improvement of the management of the SCI and SPA Cabo de Gata-Níjar	Cabo de Gata	Spain	2001-2005	4,3
LIFE00 NAT/P/007088	Salinas do Sado - Preservation of the birds population in the salines of the Sado River Estuary	Sado	Portugal	2002-2005	0,94
LIFE03 NAT/E/000055	Humedales andaluces - Conservation and restoration of wetlands in Andalucia	Odiel	Spain	2003-2006	2,9
LIFE03 NAT/E/000054	Costas Cádiz - Conservation of coastal habitats of the Province of Cádiz	Trocadero Island	Spain	2003-2006	2
LIFE02 NAT/IT/008523	Tarquinia - Environmental rehabilitation of the Natural Reserve of Tarquinia Salt-works	Tarquinia	Italy	2003- 2006	1
LIFE03 NAT/P/000014	SAMOUCO - Optimizing habitats for birds at the Samouco saltpans, Tagus estuary SPA	Samouco	Portugal	2004-2006	0,76
LIFE03 NAT/SLO/000076	Secovlje - Conservation of endangered species and habitats in the Secovlje salt-pans Park	Sečovlje	Slovenia	2003-2006	0,71
LIFE08 NAT/E/000077	CIRCUREVIEJA - Decantation circuit of residual salts and ecological recovery of the Natural Park of Las Lagunas de la Mata and Torrevieja	Torrevieja	Spain	2010-2011	0,4
LIFE08 NAT/BG/000277	LIFE FOR THE BOURGAS LAKE - Ensuring Conservation of Priority Bird Species and Coastal Habitats at the Bourgas Natura 2000 Wetland Sites	Bourgas	Bulgaria	2010-2014	1,8
LIFE09 NAT/SI/000376	MANSALT - Man and Nature in Secovlje salt-pans	Sečovlje	Slovenia	2010-2015	7
LIFE11 NAT/BG/000362	Salt of Life - Urgent Measures to Restore and Secure Long-term Preservation of the Atanasovsko Lake Coastal Lagoon	Bourgas	Bulgaria	2012-2018	2
Inland salinas					
LIFE03 NAT/E/000059	Habitats N-E Murcia - Integral management of the habitats of Northwest region of the Murcia Province	Rambla Salada	Spain	2004-2007	2,6
LIFE04 NAT/ES/000035	Fartet Murcia - Conservation of Aphanius iberus genetic stocks (Murcia)	Rambla Salada	Spain	2005-2008	1,1

Source: Own elaboration, with data from the LIFE programme database,
URL: http://ec.europa.eu/environment/life/project/Projects/index.cfm [Retrieved March 2016]

Table 4.13: List of LIFE-funded projects in saltscapes and salinas (Cont.)

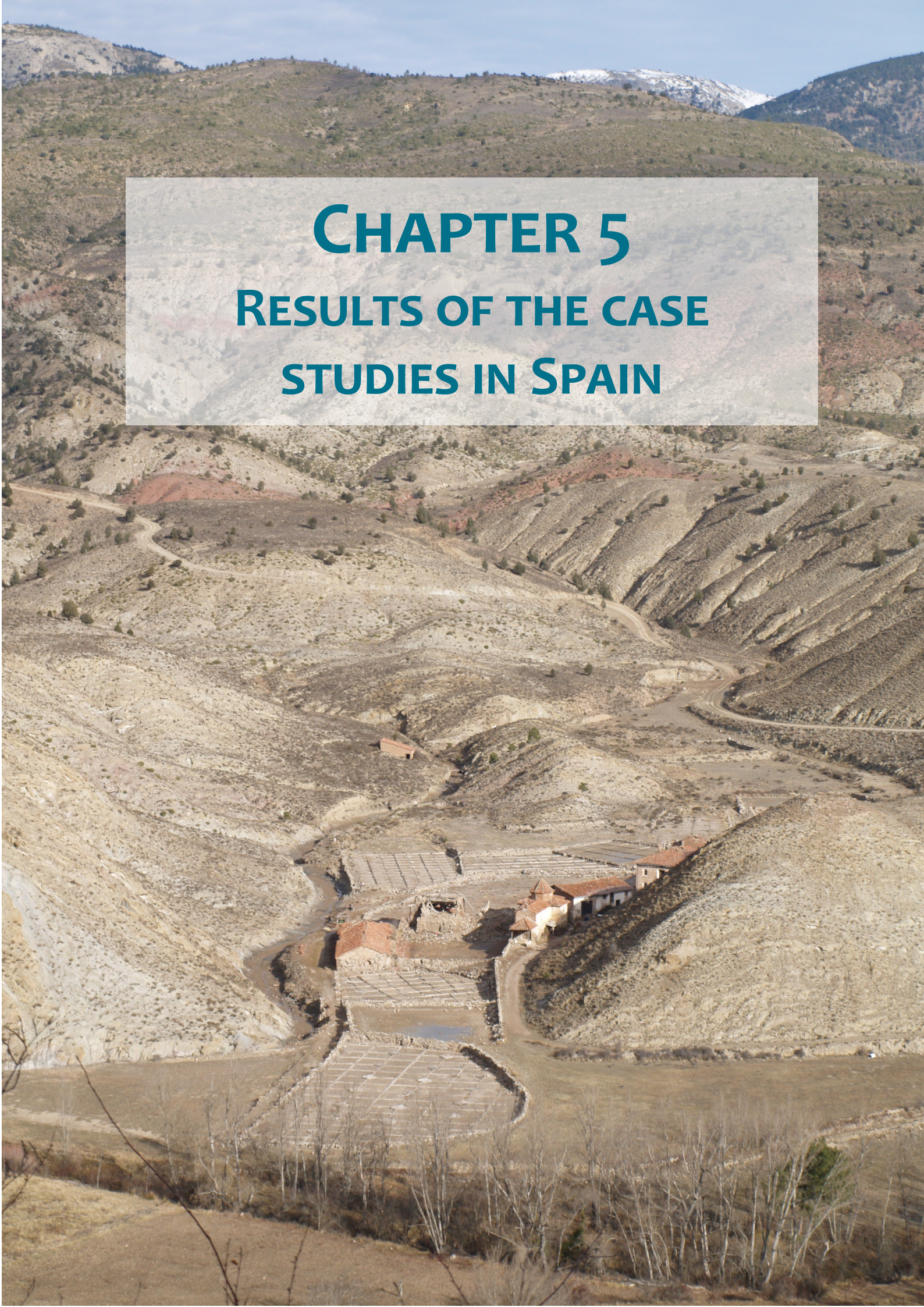
Code	Name	Site	Country	Dates	Budget (mill €)
Saline lakes					
LIFE95 NAT/F/000493	Salt springs of the Auvergne	Auvergne	France	1995-1998	0,43
LIFE96 NAT/E/003096	Flora Aragón - Conservation of thirteen endangered plant species in Aragon	Gallocanta	Spain	1997-2000	1
LIFE99 NAT/E/006339	Villacañas - Restoration of three wetland areas in Villacañas (Toledo)	Villacañas	Spain	1999-2002	0,51
LIFE99 NAT/E/006350	Avutarda/Villafafila - Management of the Great Bustard's habitat in the ZEPA of Villafáfila	Villafáfila	Spain	2000-2003	0,48
LIFE99 NAT/E/006405	Gallocanta - Restoration, conservation and management of the Gallocanta lagoon - ReCoGeSAL-	Gallocanta	Spain	2000-2003	0,46
LIFE10 NAT/ES/000563	HUMEDALES DE LA MANCHA - Restoration of salt flats around 27 endorheic wetland areas in La Mancha	Lagunas de La Mancha	Spain	2011-2016	2,6

Source: Own elaboration, with data from the LIFE programme database,
URL: http://ec.europa.eu/environment/life/project/Projects/index.cfm [Retrieved March 2016]

4.5 Conclusions

This chapter has analysed the state-of-the-art of European saltscapes and salt heritage from three points of view: the provision of ecosystem and cultural services, their protection and their management. The acknowledgement of the services semi-natural landscapes such as these provide is a fairly recent phenomenon. However, it is a necessary step to understand the need to protect them. Also, the main threats and challenges these landscapes face are being analysed. Direct threats include abandonment, land use changes, agriculture intensification and irrigation runoff, drainage, dessication, wild recreation and vandalism. Indirect threats, but perhaps more harming, are ignorance, indifference, administrative burdens and, at a larger scale, climate change. The fragility of saltscapes and salt heritage has been thus shown and different protection instruments applicable for them are then proven. From international agreements to national instruments, European saltscapes can be protected as World Heritage sites, Geoparks, Man and Biosphere reserves, Ramsar sites, Natura 2000 sites, Important Bird Areas or simply be recognised as intangible cultural heritage assets. These respond to the need to protect the singularity of a certain feature, such as bird fauna, botanical or geological assets, buildings, traditions, etc, whether individually or as a whole. Nevertheless, these protection instruments have different areas of interest, varying degrees of commitment and they often overlap on one single site. Indirect protection measures, such as the inclusion in cultural routes, the compliance with certain laws and regulations that protect certain types of salt (e.g. *fleur de sel*); the use of labels and certifications -whether official or private, such as PDO or Slow Food-, allow a certain level of safeguarding salt making traditions. Besides from direct or indirect protection measures, saltscapes and salt heritage in Europe benefits from the management of their assets. To this end, an adequate identification of stakeholders should be made, in order to avoid mismatches between the different needs and wishes converging at the site. To this end, public participation at all levels (information, consultation and active participation) is necessary. Once the stakeholders have been identified, the management strategy can be outlined in a plan, that can be of diverse nature. Examples are Master Plans, often focused on architectural recovery, or natural protected area plans such as those used in the Natura 2000 network or in Spanish protected areas (PORN, PRUG, PDS). An additional planning

instrument are the tourism plans (PDTs), that ideally should complement the others. A few words are devoted to funding, perhaps the most important limiting factor in the recovery and maintenance of natural and cultural heritage. The financing of these projects has traditionally come from public institutions, but today stem from a combination public administrations and private entities. Investment is considered the key concept in the maintenance of heritage, as it goes beyond the effect of single-effect donations. The role of European funds and the need to co-finance them is stressed. The most important salt-related transnational projects are reviewed (All About Salt, Sel-Salt of the Atlantic, ECOSAL Atlantis and MC-Salt), highlighting the main achievements. Finally, the role of the LIFE funds on the conservation of the natural values of saltscapes has also been indicated. This combined analysis of the protection, planning and management instruments provides an overview of the complex nature of salt heritage and saltscapes and sets the basis for the understanding of the specific narratives of the study sites, that follows suit.



Chapter 5
Results of the case studies in Spain

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5.1 Introduction

In this chapter, the first true results are offered. The nine inland salinas in Spain that are protected as a monument are studied here from the point of view of their patrimonialization processes. A general introduction is provided on the geological, climatic and technological background of inland salinas in Spain. The reasons for choosing salinas protected as BIC, as compared to other protection instruments, are also indicated. Before proceeding to the narratives of each case study, the nine sites are presented jointly from the starting point of the process of declaration as BIC and includes current ownership and management practices, as well as societal issues such as local demographics. The indicator scores obtained are shown, both in overview as in detail, plus the general features of all nine patrimonialization processes. The latter includes a timeline of events for the sites, allowing a fast comparison among them. The bulk of the chapter is the construction of the narratives of the patrimonialization processes in each of the nine sites, based on the interviews, the field visits and the bibliographic survey performed. Hence the narratives are a reconstruction of the events that eventually have led to the transformation of the sites from a situation abandonment to a heritage-based activity, with different degrees of success. In each case, the starting point is the privatization of the salt making activity as established by law in 1869. After that follows the description of how they declined as productive facilities and how they have been seen and considered for protection as a monument, and how far the protection, recovery and sound use of the sites, have got. In addition, a summary of the current socioeconomic situation of the sites as well as the good practices, are being dealt with. The chapter ends with an overview of the good practices found in all sites, plus the challenges that lie ahead of them, as a whole.

5.2 Origin and location of Spanish inland salinas

As explained in Chapter 3, the Iberian Peninsula constitutes a reservoir of saltscapes and other salt-related heritage at continental, if not at global scale. The fortunate coincidence of a natural abundance of underground salt, a long coastline[58] and a favourable climate have allowed the production of salt in most of its territory since prehistoric times. Figure 5.1 shows the location of underground salt deposits in Europe, roughly corresponding to where the current salt production sites are.

A closer look at the Iberian Peninsula shows that there have been two key moments of halogenesis[59], namely the Triassic period (ca. 200 million years ago) and the Miocene epoch (23 - 5 million years ago), as has been explained in Chapter 3. During the first, the eastern half of the present-day Iberian Peninsula was covered by the Thetys sea (Figure 3.3a) and much later, during the Miocene, the southeast was partially inundated by the Mediterranean sea

[58] The coastline of Spain is 7,905 km long (including the Balearic and Canary Islands) URL: http://www.ine.es [Retrieved March 2016].

[59] Halogenesis is a geological process characterised by evaporite sedimentation and formation of fossil salt deposits. It typically takes place in two stages. The first consist of an accumulation of concentrated brine and the second, much shorter, in which salt precipitates. Depending on the characteristic microelements of the brine, it can be a carbonate, sulfate, or a chloride halogenesis, the latter giving sodium chlorine deposits as a result. Depending on the origin of the water, it is subdivided into continental and marine. Halogenesis requires an arid climate, enough brine and a slightly depressed surface on which salt deposition is taking place. The process gives rise not only to salt deposits but also to stocks of highly concentrated brines in the depths of the earth (Valiashko 2010).

(Figure 3.3b). Also continental depressions filled with remains of the Thetys sea were still found in the central and northeastern peninsula. On the other hand, the Iberian Peninsula has a predominantly Mediterranean climate[60], with some variations that mainly depend on altitude and distance to the coast. Warm, dry summers are the ideal conditions for the production of salt, as they maximise evaporation of the water fraction of the brine and ensure the drying of the resulting salt. Wind is an additional asset to facilitate evaporation. Both the high tablelands and the flat coastal areas catch enough breeze to allow the dispersion of water vapour away from the salinas.

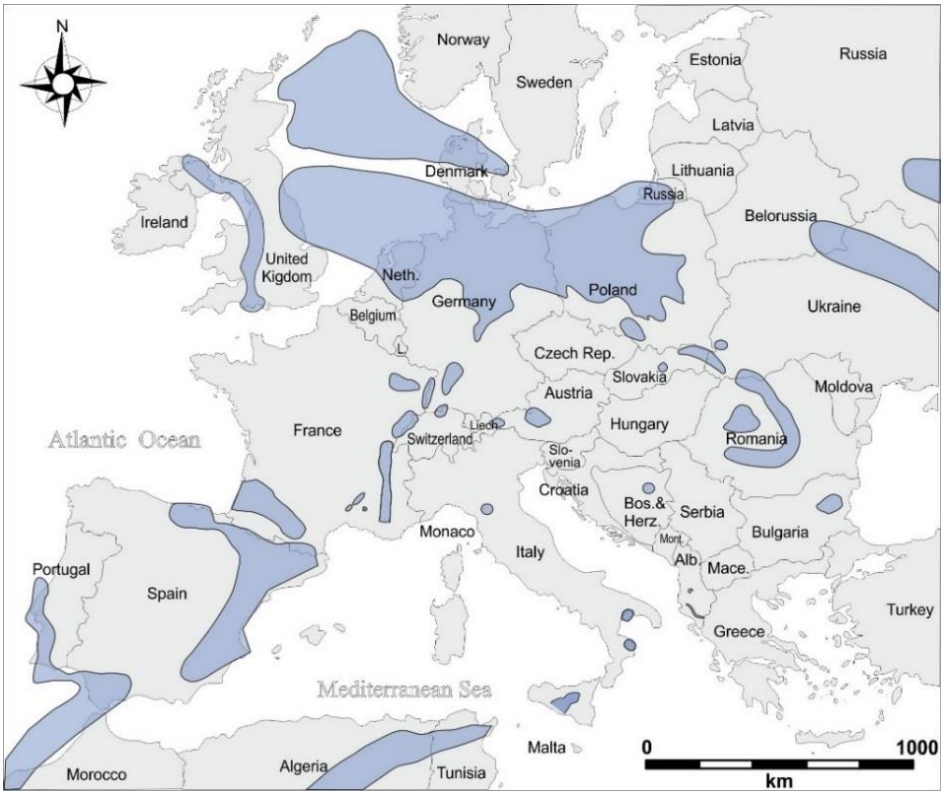


Figure 5.1: Underground salt deposits in Europe
(Source: Gillhaus & Horvath 2006)

The Iberian Peninsula can be considered a reservoir of solar evaporation salt making sites at continental level, especially with respect to inland solar evaporation sites. Figure 5.2, on the other hand, depicts the abundance of inland salinas in the Iberian Peninsula. The black dots concentrate on the eastern half of the region, nicely overlapping with the areas originally covered by the sea as represented in Figures 5.2 and 5.3.

[60] According to the Köppen-Geiger classification, the Mediterranean climate is characterized by dry and warm summers and cool to mild and wet winters. This climate type can be divided into *Standard mediterranean* and *Continentalized mediterranean*, depending to altitude and the mildness/harshness of the winter season. The first is found in the Iberian coastal areas, except the northern Atlantic coast, as well as the Guadalquivir, Tagus and Guadiana basins. The second predominates in the inland tablelands (*Submeseta norte* and *Submeseta sur*). The northern part of the country (Basque Country, Asturias, Cantabria and Galicia) is dominated by an oceanic climate, whereas the south-eastern part of the country, especially Murcia, and the Ebro valley have a semiarid climate. In these areas, the dry season continues well beyond the end of summer (Agencia Estatal de Meteorología 2011; Kottek *et al.* 2006).

Why this does not happen in the rest of Europe has a clear explanation. Although underground salt deposits and brine sources are widespread over the continent, the climate does not allow their exploitation by solar evaporation and other techniques have been used for that purpose (see Chapter 3).

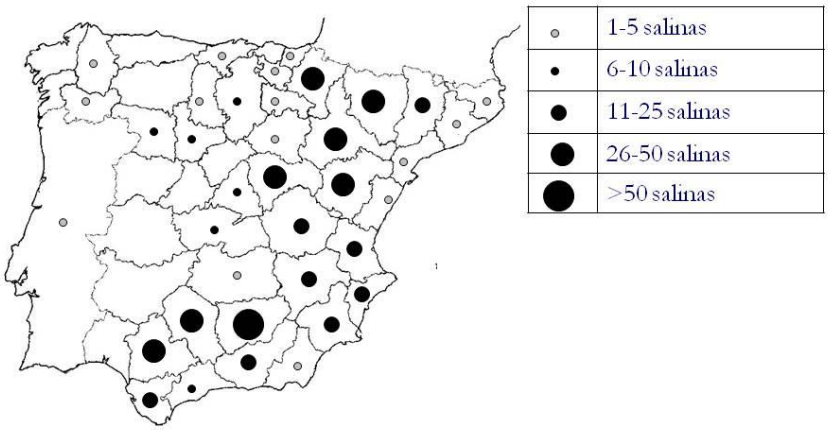


Figure 5.2: Distribution of abandoned and operating inland salinas in the Iberian Peninsula, according to their abundance at provincial level (Source: Own elaboration)

The classification of Iberian salinas is a complex task, given their diversity of locations, techniques and sources of brine, among other factors. In the inventories of Iberian saltscapes by Carrasco and Hueso (2008a) and Hueso & Carrasco (2009a), four rough categories were proposed: Coastal salinas, inland salinas, salt mines and saline wetlands. The first refers to solar evaporation sites fed primarily by seawater and therefore located in or near the coast, including lagoons and estuaries. The second, by contrast, are those salt making sites fed by brine sources, most of them producing salt by solar evaporation, but also by seething in a few cases. Salt mines are those facilities that use classical rock mining or modern vacuum techniques to obtain salt. Saline wetlands are bodies of salt water ocurring naturally, including lakes, lagoons, rivers and marshes. The main difference is that these sites existed prior to their exploitation or have not been used at all to obtain salt. Simple as this classification may seem, there are some cases of overlap that should be taken into account. To name a few: Salinas de Torrevieja, in Alicante, is known as the biggest coastal saltworks in Spain, but is partially fed by brine from the La Mata lagoon, a few kilometers inland. Also, part of the rock salt obtained in the Remolinos mine, in Zaragoza, is dissolved and recrystalised in a solar evaporation facility above the ground. The salt obtained in Poza de la Sal, Burgos, by solar evaporation had been previously dissolved in a primitive, hand-made underground gallery system through which water was channelled. Some natural salt lakes such as Fuentedepiedra in Málaga; Bujaraloz in Zaragoza or Quero in Toledo, to name a few, have been manipulated to facilitate the production of salt.

Given this diversity, why a focus on solar evaporation and not include other salt making techniques anyway? Traditional salt production by solar evaporation stems from a unique and close relation between humans, the salt and the landscape that provides it and lives with it. Other salt making techniques may have had similar implications at landscape level (e.g. selnering) but were not present in this region; others may lack the strong link to it (e.g. seething, mining). Even though numerous industrial solar saltworks exist and the mechanization of the process threatens with the loss of a highly valuable craftmanship, a fair number of traditional and artisanal solar salinas still exist in Europe and lend themselves for

study. In Spain and Portugal alone, for instance, ca 40 artisanal salt making sites are still in operation, most of them selling their salt as a commodity, others produce it for demonstration purposes (see Table 1.5). The close relationship of the traditional activity to nature and the landscape, already explained in previous chapters, also creates unique saltscapes. In Andalusia alone, several subtypes of saltscapes have been identified and categorised according to location (coast / inland), biogeographic conditions (fields / lowlands / marshes), topography (mountain / slope / valley), main socioeconomic activity of the area (rural / periurban / urban), etc. (Román 2014). Many of the rest of the Iberian salinas would fit in one of these, whereas many others would need new categories or new criteria (e.g. the case of Poza de la Sal; the Canarian salinas built on volcanic ground; the primitive salt harvesting sites on rocky coasts; salinas huddled deep in the Atlantic estuaries, etc.). Although this task would go beyond the scope of this thesis, it is no doubt necessary in order to better characterise and understand the condition of European saltscapes.

5.3 Overview of the patrimonialization process of the sites

The patrimonalization of salt heritage can be understood from many different perspectives. In general, as discussed in Chapter 2, it refers to some form of acknowledgment of the values of the site beyond their merely instrumental one. This can be expressed from an institutional standpoint, with the protection of the site under various instruments: nature park, nature reserve, cultural site of interest, etc (see below). On the other hand, the site can be valued simply by producing salt with an added value – presented to the public as artisanal, high quality, gourmet, or similar categories– or by showing the site to visitors. In some cases, salt harvest demonstrations are given, too. Both the top-down or the horizontal approaches are complemented with the existence of more sophisticated insfrastructures for visitors. Usually, natural protected areas feature interpretation centres, whereas sites with a stonger cultural heritage tend to open salt-related museums. The latter are also found in (former) industrial saltworks and mines, as a means to open their activity to the general public.

Saltscapes and salt heritage can be protected by numeruos instruments, as has been discussed in Chapter 4. However, most of them, focus on the natural values of the site, often unrelated to the salt making activity or even "in spite" of it. This is also the case for Spain and Portugal (Table 5.1). There seems to be a slightly higher interest in protecting their natural values, especially their birds, with a logical bias towards natural saltscapes. There is a striking absence of Ramsar sites among inland salinas, which may be explained by their relative small size and, as a consequence, small bird communities they host. On the other hand, the distribution of cultural protection measures seems to be rather balanced among coastal and inland salinas, although they scantly represent 1,5% of all saltscapes. Whereas natural protection instruments (e. g. Natura 2000, Ramsar) tend to overlap, there is usually no overlap between natural and cultural protection instruments[61].

[61] The overlap between natural protection instruments is difficult to assess because the same site may bear different names. Only by cartographic research can be seen with a certain degree of accuracy how much these site's statuses overlap. For instance, many nature 2000 sites are both SCI and SPA, whereas other only bear one of the two categories. With respect to the overlap between cultural and natural protection statuses, only two inland sites in Spain (and none in Portugal) bear both, namely Valle Salado de Añana (Ramsar, Cultural Landscape and BIC) and Salinas de San Juan (Regional Park, Natura 2000 and BIC).

Table 5.1: Protection status of salinas in Spain and Portugal

Type of saltscape	Nr sites	SCI[1]	SPA[2]	Ramsar	BIC/Monum.	Museum[3]
Coastal salinas	173	4	3	6	6	14
Inland salinas	516	8	7	0	9	6
Other saltscapes	276	23	12	6	1	7
Total saltscapes	965	35	22	12	16	27

[1]Site of Community Interest & [2]Sprecial Protection Areas (Habitats and Birds Directives, see Chapter 4)
[3]A museum is not a protection instrument in itself but denotes a willingness to protect (salt) heritage
Source: Own elaboration

Table 5.2 describes the nine study sites in Spain according to the different features presented in Chapter 3. All of them can be considered as traditional salt making sites by solar evaporation and use the same source of energy, namely the sun and wind[62]. While the leandscape may vary (mountain, valley, tableau), most of the sites are fed by groundwater and two, by the artificial dissolution of a diapir (Poza; Añana also lies on a diapir, but the brine reaches the surface naturally) and the detraction from a saline river (Rambla Salada). But what is most striking are the differences in the state of the facilities, from active to ruined, depending on the location. What has happened in each site and why some are in better condition than others, is what I will try to explain in the next pages.

Table 5.2: Description of the study sites in Spain according to criteria in Table 3.2

Site	Geophysical features			Productive features			
	Location	Landscape	Hydrogeol. origin	Production method	Energy source	Scale	State of facilities
Spain							
Añana	Inland salina	Mountain	Groundwater	Trad. solar evaporation	Sun & wind	Artisanal	Active
Poza	Inland salina	Mountain	Diapir	Trad. solar evaporation	Sun & wind	Artisanal	Active
Rambla S.	Inland salina	Valley	Saline river	Trad. solar evaporation	Sun & wind	Artisanal	Active
Gerri	Inland salina	Mountain	Groundwater	Trad. solar evaporation	Sun & wind	Artisanal	Active
San Juan	Inland salina	Valley	Groundwater	Trad. solar evaporation	Sun & wind	Artisanal	Active
Imón	Inland salina	Tableau	Groundwater	Trad. solar evaporation	Sun & wind	Semi-industrial	Abandoned
Peralta	Inland salina	Mountain	Groundwater	Trad. solar evaporation	Sun & wind	Semi-industrial	Abandoned
Arcos	Inland salina	Valley	Groundwater	Trad. solar evaporation	Sun & wind	Semi-industrial	Abandoned
Espartinas	Inland salina	Valley	Groundwater	Trad. solar evaporation	Sun & wind	Semi-industrial	Ruined

Source: Own elaboration

5.3.1 Inland salinas protected as BIC

Among the ca 40 traditional salinas that are still in operation (whether selling industrial or artisanal salt, or only offering demonstrations to the public), 12 are inland salinas, that is, less that one third of them. This group is clearly underrepresented in relative terms, bearing in mind that inland salinas constitute 75% of all –past and present– solar evaporation sites in

[62] Please note that some authors consider wind as a form of solar energy, as the movement of air is a consequence of differences in the temperature of air masses. For the clarity of the text, I specify both.

Spain and Portugal. In addition, most of them fare in worse condition than operating salinas at the coast[63]. On the other hand, of the inland salinas that still remain standing (number unknown), nine of them have been protected by law as a monument (see Chapter 4). This protection status has not always been granted to salinas in operation and the state of conservation varies much from one site to the other. Given the fact that the procedure to protect a site needs documentation to justify this measure, these salinas are better known to the public and have received more interest and attention from the press, academia, etc. Hence, in this chapter, I will look at the reasons to protect these sites and whether this status may have contributed to the conservation and sound use of the salina and its surrounding landscape.

Figure 5.3 shows the location of the 9 inland salinas that have thus far (status: 2016) been protected as a BIC (monument) by Spanish law.

Figure 5.3: Location of the nine inland salinas protected as BIC in Spain
(Source: Own elaboration)

All 9 sites have been tested with the indicator tool described in Chapter 1 and Annex 1. The indicator tool gives a result between 0 and 100, according to how well the site and its relation to the local community is doing. Table 5.3 presents the final grading of each study site. It also indicates the main features of the salt making site: Wether it is operating and, if yes, what is it producing (salt or brine)[64] and if it is prepared to receive visitors. The table also shows the date of declaration as BIC and the type of institution that has initiatied the declaration process; whether it is a public administration (Gov), an association or other not-for-profit entity (NGO) or a private individual (Priv). The next column indicates whether this institution has an influence in the current management of the site. Finally, the table shows the kind of ownership the site has.

[63] Coastal salinas have had a stronger competition for the use of space than inland salinas, therefore, those coastal sites that are still in operation, are in relative good state of conservation, whereas many of the inland sites do not have the pressure to render profits and are found in different degrees of decay.

[64] Collecting brine is a simple operation than only needs a pumping device and a storage place. Producing salt, on the other hand, requires a well-functioning hydraulic circuit, a certain know-how of the process and more manpower. The sale of brine is usually the last resort of a site before its final closure, after the abandonment of the salt making activity.

The results are presented in decreasing order of score. Salinas de Añana has obtained the highest, with 90/100, thereby indicating that is has a solid recovery projet and a strong relationship with its local community. The lowest grading, Salinas de Espartinas, is 22/100. It is a site that is currently unmanaged and is abandoned in a private ground whose owner is not investing efforts in its recovery or use. Hence, grades are highly variable despite the protection by law. Those salinas with a grade above 50 are actively selling salt and offer the possibility to visit them. Although the quality of the salt (-packaging) and the conditions of the visit also vary considerably, there seems to be a correlation between the fact that the salina is operating and its grading above this landmark. More details on the scores follow below. On the other hand, the date of declaration does not seem to have an influence on how well a salina scores. Among the three top grades are the oldest BIC (Salinas de Añana, declared in 1984) and the youngest (Rambla Salada, in 2016).

Table 5.3: Features of the patrimonialization process of the nine inland salinas protected as BIC in Spain

Site	Sum indi-cators	In pro-duction	Open visitors	Declared BIC	Institution declaring BIC	Influence in mana-gement	Ownership
Añana	90	Salt	Yes	1984	Gov	+	Private[1]
Poza de la Sal	67	Salt	Yes	2002	NGO	+	Public/Private[2]
Rambla Salada	64	Salt	Yes	2016	Gov	+	Public
Gerri de la Sal	55	Salt	Yes	1996	Gov	+	Private/Public[3]
San Juan	54	Salt	Yes	2007	NGO	+	Public
Imón	46	Brine	No	1992	Priv	-	Private
Peralta	40	No	No	2007	NGO	-	Private
Arcos de las S.	30	No	No	2010	Gov	-	Private
Espartinas	22	No	No	2006	NGO	-	Private

[1]Transferred to public authority
[2]Only publicly owned part is recovered
[3]Salt making area is private; salt storage building (now museum) is public
Source: Own elaboration

In Spain, the process to declare a site as BIC is usually initiated by an institution that requests this protection status to the regional authority in charge of historical heritage. The institution is then required to present a file with information that justifies this declaration and, if it is deemd just, the regional authorities ultimately does so. In the case of the 9 salinas, the institution initiating the process also varies highly. Four of them have been initiated by the public administration itself (Regional Administration in the case of Rambla Salada; Provincial Administration in the case of Añana; local administration in Gerri de la Sal and Arcos de las Salinas). Four others have been initiated by NGOs (one local trust in the case of San Juan; the rest by local cultural associations). In the case of Salinas de Imón, the process was initiated by a writer / journalist who considered the site worthy of it[65]. Regardless of the institution initiating the process, what seems to have an influence in the grades is the implication of this institution in the current management.

[65] For unknown reasons, he failed to include its sister salina, Salinas de La Olmeda. Historically, both sites have operated together since the 16th century under a common entity, *Las Salinas de Ymón y de La Olmeda,* and share size, salt making techniques, architectural values and landscape values. Imón lies on the road between the well-known mediaeval towns of Sigüenza and Atienza, whereas La Olmeda lies 2-3 km away from it, hidden from sight. May this be the reason?

The sites marked with a plus sign on the table, indicated that the institution promoting its protection is actively engaged in the current decision making processes or is the actual manager of the site; whereas those marked with a minus sign have no influence at all in the decisions affecting the site. Again there seems to be a clear correlation between the motivation to declare a site protected and the implication in its future, actual protection.

5.3.2 The issue of ownership

The ownership of the sites is a complex issue. All sites became privately owned after the privatization law in 1869[66]. When some of the sites declined and were eventually abandoned, some of them have eventually been acquired -in part or totally- by a public authority. The regional environmental authority of the Region Murcia bought the salinas of Rambla Salada; the Salinas de San Juan were purchased by the municipality of Saelices de la Sal; one productive unit, the *granja de Rusalado*, was bought by the municipality of Poza de la Sal; and the tourism authority of Gerri de la Sal owns the storage building, now transformed into a museum[67] and hosting other municipal facilities. The productive units of Salinas de Añana are still in private hands but the owners have transferred the right of use to a public trust. All others are in private hands, usually individuals or families, except for the case of Imón, owned *de facto* in 98% by a consortium of salt-related companies. The ownership situation is quite relevant to undestand the scores. Publicly onwed sites have better chances to obtain financing for restoration and recovery activities, whereas private owners need to support these investments by themselves. Being individuals, the costs are often too high for them to bear and the salinas remain untouched[68]. More details on the efforts to recover the sites follow below.

Not only ownership, but the organisation of salt workers seems to have been a relevant factor in the willingness to recover the salinas. Those salinas that were traditionally exploited by communities of owners/workers[69] in the past (e.g. Salinas de Añana, Poza de la Sal, Gerri de la Sal) have had a higher score in the indicator system. Today, the collective system of production in these sites has been modernised, but it remains a group's effort. In Salinas de Añana, the salt workers now belong to a private company -*Gatzagak S.L.*– that has an agreement with the *Fundación Valle Salado*, the not-for-profit public trust in charge of the recovery, sale of salt and tourism activities in the valley. In Poza de la Sal, the *Asociación de Amigos de las Salinas de Poza*, a private, not-for-profit NGO has signed a cooperation agreement with the Municipality of Poza de la Sal and is in charge of the recovery, production

[66] Established by state decree on 16 June 1869 (*Ley del Desestanco de la Sal*) and which came into force on January 1st 1870

[67] Few so called museums would comply with the officially accepted definition of a museums, provided by the International Council of Museums, ICOM, in their Statutes, adopted by the 22nd General Assembly in Vienna, Austria on August 24th, 2007: "A museum is a non-profit, permanent institution in the service of society and its development, open to the public, which acquires, conserves, researches, communicates and exhibits the tangible and intangible heritage of humanity and its environment for the purposes of education, study and enjoyment.". For the purpose of this text, I will use the term in its more popular meaning, encompassing visitor centres, interpretation centres, private collections, permanent exhibits, etc.

[68] It has to be understood that these private owners purchased a site in operation, with the expectation to obtain a revenue from the production of salt, that gradually declined. Despite investments in the technical improvement of the facilities, these rendered quickly obsolete or incapable to deal with competing industrial sites and maintenance became an unnecessary luxury. The shift in paradigm from salt making to heritage care is a difficult step to take for individual owners.

[69] Commonly referred to as *Comunidad de Herederos* (Community of Heirs), with local variations

and leisure activities in the Rusalado section of the salinas. In Gerri de la Sal, on the other hand, the community has gradually been dissolved but one single producer is still active in the area. Residents in these sites have a strong sense of belonging to the salt making activity and declare to feel nostalgic about its loss. The salinas of Rambla Salada used to belong to a private individual, who sold the site to the regional environmental authority of the Region Murcia. Today, this authority has outsourced all recovery, salt making and environmental education activities to the *Asociación La Carraca*, a local NGO specialised in mobilising volunteers. The motivation to recover the salt making activity stems rather from the new generation of volunteers, rather than former salt workers, save the ocassional exception.

The case of Imón seems especially representative of the difference between a community-driven salt making activity and when this is steered by outsiders. Imón is the sole case of continuous corporate ownership after the privatisation up to today, whith a rather complex composition of ownership[70]. The owners were never engaged in the salt making process itself; to this end, labourers were hired every summer, many of them coming from Andalusia. Although a few local people were employed by the company, the local community has accepted the abandonment of the site and does ot seem nostalgic of its period of operation. In addition, the heirs of the owners lacked the entrepreneurial spirit of their forerunners and, when difficulties arose and profits fell, simply lost interest in the business. Dinsinterest and abandonment followed suit. As a consequence, the company has repeatedly ignored the calls both from the authorities as the civil society to recover the site, even to their own profit.

The other sites were owned by individuals prior to their abandonment. All of them declare how costly it had been in the last decades to maintain operation until they finally decided to stop. Today, only in Saelices de la Sal the ownership has changed. With it, a recovery project was set up and younger salt makers have taken over the production of salt in the area since 2013. The rest (Espartinas, Arcos de las Salinas and Peralta) have not been able as of yet to start a recovery project. Only in Peralta de la Sal an agreement has been signed in 2012 between the onwers and the local *Asociación Castell de la Mora*, which has allowed minor cleaning and consolidation work ever since. Efforts are now being made the strengthen this agreement.

5.3.3 Socio-demographic features of the study sites

A common weakness of most sites is their remoteness and low population density. Table 5.4 and Figure 5.4 show the decline in population in most areas (except Ciempozuelos, in the outskirts of Madrid; Fortuna, in the outskirts of the regional capital, Murcia; and Sigüenza, a town with 28 hamlets that has recently attracted some elderly people living in the corners of its vast territory). Excluding these three exceptions, all other municipalities have lost between 70 and 95% of their population in the last century. This loss has been quite gradual and the remaining residents are reaching retirement age[71].

[70] Officially, the entity governing the site is the *Condominio de Propietarios de las Salinas de Imón y de La Olmeda*, an obsolete legal form in which all participants own a percentage of the total physical assets of the company, rather than a portion of them. The idea behind this structure was to avoid the fragmentation of the property, essential to ensure a good production of salt. When the condominium was created in 1873, all 13 founders owned a similar percentage. With time, inheritances, donations and transactions have modified this balance, to the point that ca 98% of the property is now owned by a private company, which in turn is formed by a consortium of 4 or 5 salt-related businesses.

[71] These figures, however, must be interpreted with care: They do not show the recent phenomenon of "rural commuters", i.e. a part of the population that prefers to live in the larger towns -due to the

It is also difficult to recruit people who are willing to do hard manual work, especially if this is weather-dependent and strongly seasonal such as salt making. Such demographic losses make it very difficult to find the human and financial resources, whether public or private, to initiate a heritage recovery project.

Table 5.4: Socio-demographic of the 9 inland salinas declared BIC

Site	Municipality	Population		Indicator score	Organisation of saltworkers	
		Census 2011	Variation 1900-2011		Past	Present
Añana	Añana	165	-79 %	90	Community	Corporate
Poza	Poza de la Sal	365	-81 %	67	Community	Association
Rambla S.	Fortuna	9,928	+77 %	64	Individual	Association
Gerri	Baix Pallars	157	-69 %	55	Community	Individual
San Juan	Saelices de la S.	57	-80 %	54	Individual	Individual
Imón	Sigüenza	32	-95 %	46	Corporate	Corporate
Peralta	Peralta de C.	245	-75 %	40	Individual	None
Arcos	Arcos de las S.	105	-81 %	30	Individual	None
Espartinas	Ciempozuelos	23,390	+484 %	22	Individual	None

Source: Own elaboration, Beltran & Vaccaro 2014; INE, URL: http://www.ine.es [Retrieved May 2016]

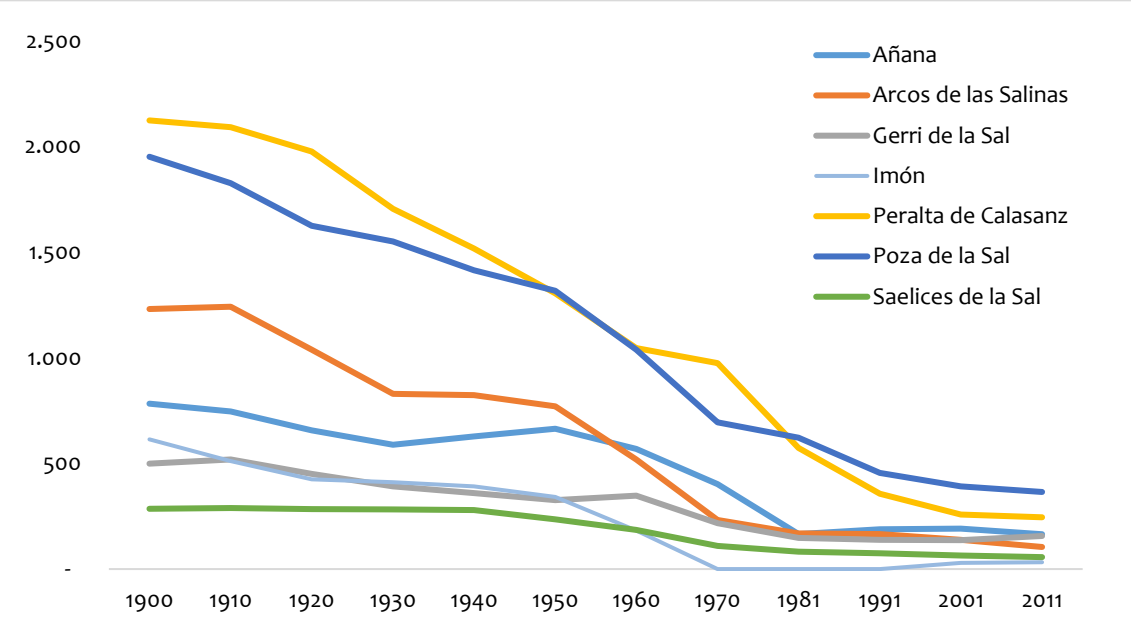


Figure 5.4: Demographic evolution of the seven sites with population loss (Source: Own elaboration, data from INE, URL: http://www.ine.es [Retrieved May 2016])

accessibility to services– and commute to their fields or activities in their village of origin. Neither do they reflect the real residential status of the population, as some may decide to register at a different location than their real place of residence, for different reasons. Mobility in rural areas has increased and population figures may not necessarily reflect the actual size or composition of the local community.

5.3.4 Results of the indicator-based tool

Table 5.5 presents the individual scoring for each indicator per site. As explained above, any given indicator has a minimum score of 0 and a maximum of 4. Therefore, the sum of all 25 indicators can range between 0 and 100. Intrinsic indicators refer to the condition of the site itself, whereas extrinsic indicators offer a picture on the relationshiop between the site and its local community, especially related to local salt and tourism businesses. Tourism and local development form two separate categories in order to gain understanding in how the local communities depend from one activity (e.g. tourism) or multiple activities (e.g. tourism, salt making…), and whether this dependence is on endogenous or exogenous resources. This will give a better indication of the health of their livelihoods. Hence, reading this table, it is clear how gradings depend on the salt making and tourism activity of the site. The indicators are designed to give higher scores to those sites that are in operation and to those which offer a higher diversity of products and services.

Figure 5.5 presents the same results in a graphic format, which allows to detect anomalies in the sites or their territories. By comparing graphs, one can also see the strengths and weaknesses of each site and where to invest efforts and resources. For instance, both Arcos de las Salinas and Salinas de Espartinas have low grades, but the latter has a bigger potential for the tourism market, by looking at the time of travel for visitors. Arcos lies more than an hour away from any significant town or city, whereas Espartinas lies within half an hour from the capital, Madrid. One the other hand, two salinas found in the same province, Guadalajara, have very different potentials. Imón is largely depending on the tourism attractions of the area and most of its visitors, although relatively abundant, are serendipitous. San Juan, on the other hand, lies further from the sources of visitors but has invested in the production of salt. The local development strategy in this area is endogenous and, although it is open for visitors, tourism seems to be a secondary issue.

Please note that all tables and figures listing the study sites, follow the score obtained, in decreasing order.

Table 5.5: Detailed values of the indicators for each site (see Annex I)

Site	Añana	Poza	Rambla	Gerri	San Juan	Imón	Peralta	Arcos	Espar-tinas
Intrinsic indicators[1]									
General									
Historical relevance	4	4	3	4	4	4	4	4	4
Protection status of the site	4	2	3	3	3	3	2	3	3
State of natural conservation	4	2	4	0	4	4	1	2	2
State of cultural conservation	2	1	4	2	4	2	3	2	1
State of conserv. intangible heritage	4	2	2	3	3	2	2	2	0
Local development									
Site in operation	4	3	3	4	4	2	1	1	0
Development plans	4	3	3	1	3	1	2	0	0
Organisation of salt makers	4	3	3	1	2	1	0	0	0
Participation in projects or networks	4	4	3	1	0	0	0	0	0
Tourism									
Tourism plans	4	3	2	1	2	0	0	0	2
Visitor infrastructures on site	4	3	3	3	2	1	2	1	0
Motivation of visitors	4	3	3	3	3	1	1	1	0
Yearly nr of visitors	4	3	2	2	1	4	2	0	0
Accessibility of the site	3	2	2	3	3	1	1	1	0
Visibility of the site	4	4	2	3	1	1	1	1	1
Extrinsic indicators[1]									
Local development									
Stakeholder diversity	4	3	3	1	4	2	2	1	2
Companies using salt	3	1	2	1	2	1	0	0	0
Visibility of the salt business	4	2	1	2	0	0	0	0	0
Direct employment	3	0	2	1	1	1	0	0	0
Tourism									
Climate/Seasonality of visitors	3	2	3	3	1	3	4	1	0
Tourist attractions nearby	3	4	2	3	2	4	4	2	2
Time of travel from tourist markets	3	3	3	2	0	3	2	2	3
Eating facilities close to the site	3	3	2	1	1	2	2	2	1
Site included in package tourism	3	3	1	3	0	1	0	0	0
Aesthetic aspects	4	4	3	4	4	2	4	4	1
Total	**90**	**67**	**64**	**55**	**54**	**46**	**40**	**30**	**22**

[1] See Annex I for a detailed description and valuing system of each indicator

Source: Own elaboration

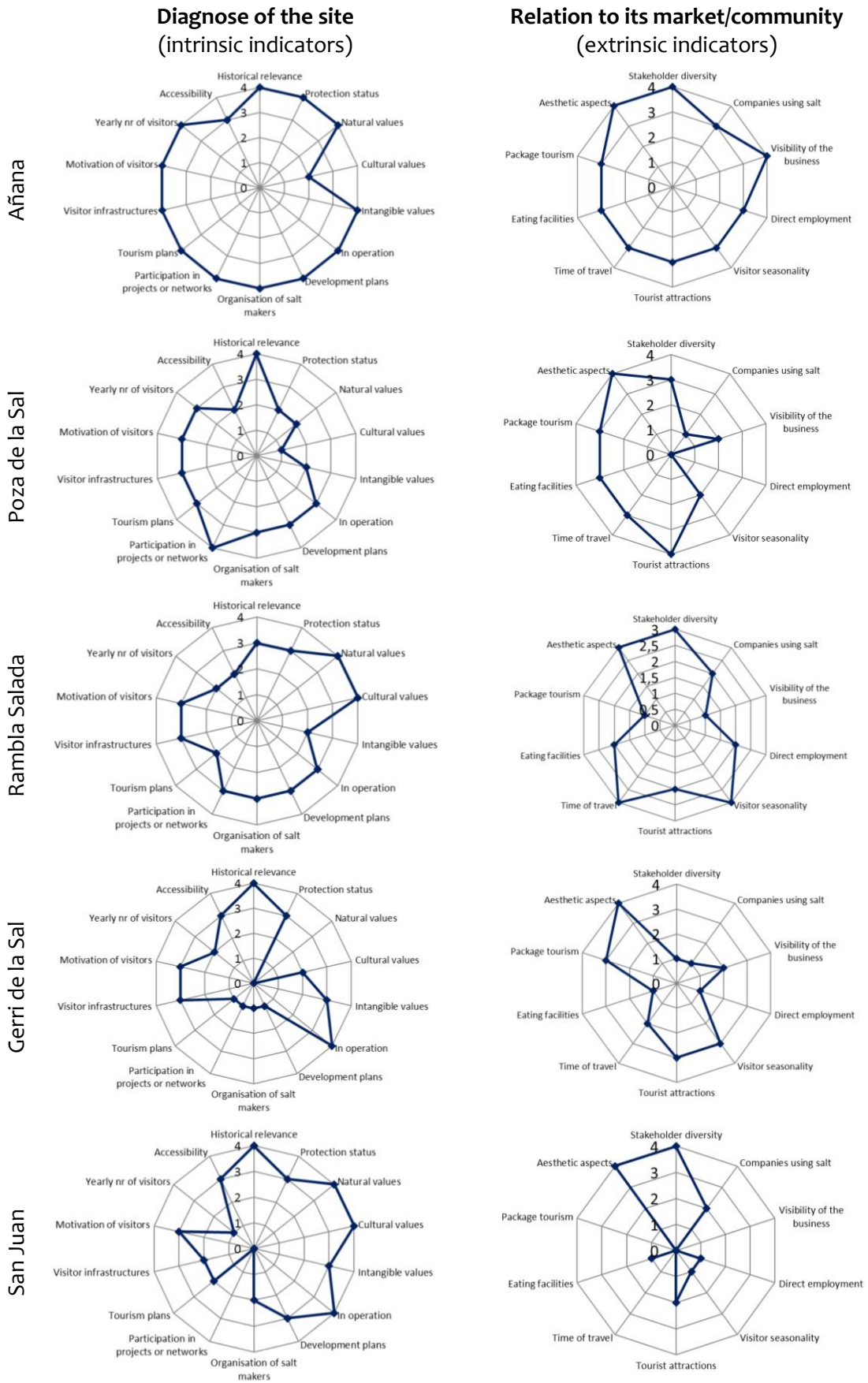


Figure 5.5: Graphic representation of the values obtained by each site for the intrinsic (left) and extrinsic (right) indicators (Source: Own elaboration)

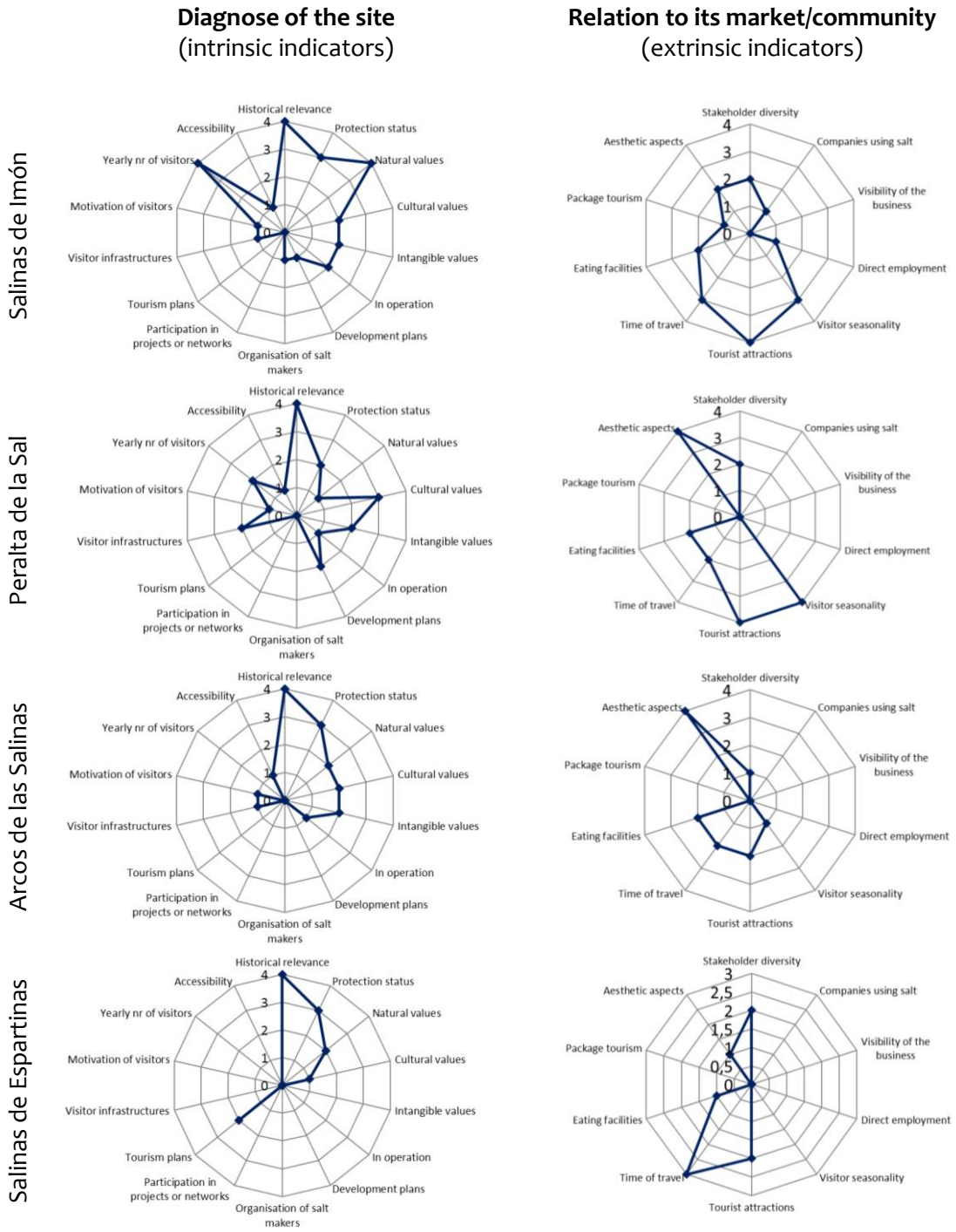


Figure 5.6 (cont.): Graphic representation of the values obtained by each site for the intrinsic (left) and extrinsic (right) indicators (Source: Own elaboration)

5.3.5 Brief historical background of the patrimonialization of the study sites

In general, the nine study sites faced a general deline due to higher production costs and lower profitability of their salt. The ultimate reasons for this are complex and analysing them goes beyond the scope of this work. Suffice to say that the process of decline lasted more than a century and was initiated some years before the privatisation of the salt making businesses, in 1869. The first serious blow to traditional salt making sites ocurred shortly after, with the consolidation of the chemical industry in Spain, which took place around 1905. The chlor-alkali industrial processes required large quantities of high quality salt that could not be provided by traditional salinas and the market shifted towards mechanised saltworks and salt mines (Toca 1997). Later on, the improvement of road networks halfway the 20th century[72] allowed the penetration of cheaper salt in most parts of the country, usually coming from coastal areas with longer productive season and biger production figures. By the sixties, the demand of salt for domestic uses had plummeted as a consequence of the generalisation of refrigerators in private homes and the salt market further concentrated in industrial activities. This last period coincided with the rural exodus that took place in Spain, with a generalised abandonment of traditional productive activities. Therefore, these salinas experienced a general decline that found its climax halfway the 20th century. In all of them, the salt making activity as it was known until then, was finally abandoned in the second half of the 20th century (see Figure 5.8). Up to that moment, none of the nine study sites had been declared BIC yet.

However, at some point institutions and scholars started to feel an interest in traditional salt heritage. On the other hand, in some sites, former salt makers with a strong sense of belonging to their activity and their site start to search for solutions to the abandonment of "their" salinas. How each process went on and how far it got, strongly differs from one site to the other. In some cases, it has not even been initiatied, save for the declaration as BIC.

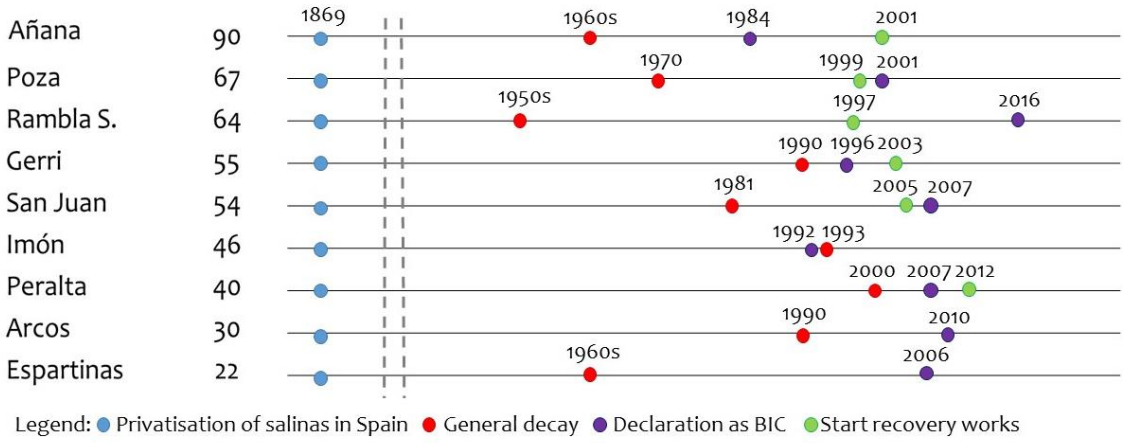


Figure 5.6: Timeline of main events in each of the study sites in Spain (Source: Own elaboration)

[72] The road network started to improve during Primo de Rivera's dictatorship (1923-1930) but was severely interrupted by the Spanish Civil War (1936-1939). Systematic road reconstruction started again in the 50s (Uriol Salcedo 1992, pp. 239 & 271)

Figure 5.6 offers an overview of the timeline of main events ocurring in the nine study sites, focusing on four milestones: The privatisation of salt making, common to all of them; the final abandonment of the industrial activity; the recovery of the salt making activity with added value (if such is the case) and the declaration as BIC. The latter two constitute two pillars of the patrimonialisation process in each of the sites. However, this process is obviously more complex and does not depend solely on this legal declaration.

5.4 The patrimonialization narratives of the study sites

Below follows a brief description of the patrimonialization process in each of the sites, based on the literature, field visits and the personal interviews performed in each of them. The patrimonialisation process was recorded as a result of the interviews with key stakeholders, as described in Chapter 1 (see also Table 5.6 and Annex 2). Most interviews took place in 2015, except for a few cases (e.g. salt makers of Imón and San Juan), which took place in 2006 and could not be repeated later[73]. The interviews ave provided a significant input to the narratives. However, the text has been built from an array of combined sources of information and therefore I do not cite individuals, save specific quotes, and bear the sole responsibility of any errors or significant omissions that may occur. The narratives of the sites typically start at the privatisation of the salt market, in 1869. Previous historical refereences are not given systematically. Many of the cited references, however, provide a historical background of the site. Similarly the salt making processes in each site or period of time are is not being described here, as it would go well beyond the scope of this work. Again, some of the references offer detailed descriptions. The text devoted to each site will indicate where to consult these aspects. For a more general description and very basic historical background, please refer to Hueso (2015b).

Table 5.6: Interviews with key stakeholders in the nine study sites

Site	Score	Owners	Managers	Salt makers	NGOs	Experts/ Academia	Local authorities	Other
Añana	90	X	X	X	X	X	X	Provincial authority Former managers
Poza	67	X	X	X	X	X	X	
Rambla	64	X	X	X	X	X	D	Regional authority
Gerri	55	X	NA	X	NA	X	X	
San Juan	54	X	X	X	NA	X	X	Regional authority
Imón	46	D	X	X	X	X	X	Regional authority
Peralta	40	X	NA	X	X	X	X	
Arcos	30	X	NA	D	X	X	X	
Espartinas	22	D	NA	NA	X	X	X	

NA = Not applicable D=Declined to participate / could not be reached
Source: Own elaboration

[73] Due to decease or having moved away from the area

5.4.1 Salinas de Añana (Álava)

General view of the Salado valley, with a brine distribution channel on the left (©Katia Hueso)

Detail of the crystallizers in Añana (©Katia Hueso)

Guided visit to the salinas, standing next to a crank, used to elevate the brine to the crystallizers (©Katia Hueso)

A group of people wading in highly concentrated brine (©Jan-Pieter de Krijger)

Figure 5.7: Images of Salinas de Añana

In 1869 the Community of Heirs recovered the power on the management of the salinas and the traditional salt making methods they had been using in the past. However, the free salt market brought a strong concurrence and the salinas tried to improve productivity at the lowest possible price (Plata *et al*. 2008, Porres 2007a, 2007b). The arrival of the railroad in the area (the station of Pobes lies 8 km east of the salinas) gave the opportunity to sell the salt further away, but also gave access to cheaper salt from the coast. In Salinas de Añana, productivity was being increased by irrationally enlarging the surface of crystallizers, building them on dangerously steep slopes, above the level of the sources or using new materials that proved useless. One of these materials was concrete, which should have contributed to minimise maintenance and cleaning efforts. However, concreted needed frequent repair due to the cracks that formed in the drying process. When the cracks became too large, a new layer of concrete was laid on top of the previous one. After some seasons, all layers needed to be removed, to preserve the wooden structure that supported them. As a consequence, large amounts of debris were formed in the valley, collapsing the streams and severely hampering the production of salt. Despite these modernisation efforts, salt was still being harvested by hand (Torres 1991).

In the beginning of the 60s, the situation was critical. The topography of the valley prevented from mechanising the production, which decreased significantly. In a few decades, the population declined from the 800 inhabitants the town had in 1900 to approximately 200 today. In 1960, the valley had around 5,000 crystallizers in operation, which went down to 150 in 2000. Production went down from 4,000 tonnes to hardly three. In the years 1999-2000 the salinas were practically inactive (Landa & Lasagabaster 2007, Lasagabaster 2002, Plata 2009, Plata *et al*. 2008).

The Valle Salado was declared BIC in 1984 with the category of Monument. The *Diputación Foral de Álava* (provincial administration), initiated a series of actions to recover the valley. Already in the 90s, they started to remove debris and the perimeter of the valley was fenced. The idea behind fencing the valley was twofold: First, to prevent accidents, second, to show that it was a valuable asset, that is was being taken care of (Lasagabaster 2006, Landa & Ochandiano 2006).

Several studies were made in the 90s to modernise and improve the production of salt, be it by enriching the brine or accelerating its evaporation by different means. These procedures were disregarded for being too expensive and gradually a change in focus in the recovery process was made (Plata & Landa 2011). In the years 1998 and 1999 *the Comunidad de Herederos de las Reales Salinas de Añana* (Community of Heirs) became a private company, *Sociedad de Salineros Gatzagak, S.L.*, which gathered all the owners of the crystallizers. With a contemporary legal structure, the ownership became unified and third parties had one single representative to address, thereby facilitating the recovery of the valley.

With the turn of the century, the first measures to create public access to the salina were taken. Paths were repaired, storage buildings were used to stock material but, above all, the priority was to restore the brine distribution system in the valley. The public was invited to visit the works, under the motto "Open for repairs", inspired by the success of a similar programme in the Santa María cathedral in Vitoria, also managed by the provincial government (Lasagabaster 2006). This required a constant adaptation of the visitors' routes to the ongoing works, so that the public could see them up close safely. This did not only provide a singular experience, but also increased repeated visits.

On the other hand, in 2001 an ambitious Master Plan –*Plan Director para la Recuperación Integral del Valle Salado de Salinas de Añana*– was initiated, equally inspired in the successful methodology and research performed in the Santa María cathedral. The Master Plan was coordinated by Juan Ignacio Lasagabaster, head of the Historical-Architectural Heritage Service of the provincial government and carried out by the Landa-Ochandiano studio of architects. It was prepared by a multidisciplinary team of experts formed by architects, archaeologists, biologists, economists, lawyers, GIS-specialists, etc. The Master Plan intended to gather a sufficient body of knowledge about the valley, both on its history, as well as on its construction, salt production methods, geology, biodiversity, etc. It documented all aspects that were deemed relevant to lead its restoration. It also focused on setting the physical limits of the monument in order to better determine its functional and landscape recovery and to organise the management and activities of the salinas and its environment to enhance its use and enjoyment by all (Landa & Ochandiano 2002, López de Eguílaz 2013, Mallarach 2005). Between 2000 and 2003 the first phase of the Master Plan was written. It included the idea of preparing a series of studies to elaborate the *Plan Integral de Recuperación de Añana* (Integrated Recovery Plan of Añana, written in 2005) and the present *Plan de Gestión* (Management Plan, written in 2009). The first document focused on the global restoration of the terraces and productive parts of the salinas and is almost finished. The second, still in force, establishes the rules for the production of salt and includes several

sectorial plans, namely the *Plan de Promoción Turística* (Tourism Promotion Plan), the *Plan del Paisaje* (Landscape Plan), the *Plan para la Rehabilitación del Casco antiguo de la localidad de Añana* (Plan for the Recovery of the Old Town of Añana) and the *Plan Estratégico para el Distrito de Añana* (Strategic Plan of the District Añana). A new version of the management plan is being prepared, which will include the know-how of the salt makers and the spatial distribution system will be simplified, in order to relax the management of the uses of the valley. The Master Plan obtained the award *Ciudad, Urbanismo y Ecología* (City, Urbanism and Ecology) in 2005 from the Official College of Architects of the Basque Country and Navarra, as well as the award of the *Fundación Fórum Ambiental de Ciudad Urbanismo y Ecología Sostenible* (Environmental Forum Trust of Suistainable Cities, Urbanism and Ecology) in 2007.

In 2009, the *Fundación Valle Salado* (Valle Salado Trust) was founded, under leadership of architect Mikel Landa and its trustees being the provincial government (6 votes), the Basque regional government (2 votes), the municipality of Salinas de Añana (1 vote) and the Company Gatzagak S.L. (2 votes). The trust was born with the goal to "continue and guarantee the sustainability process of the Valle Salado Cultural Landscape and reach again the optimal point that it had, during the past centuries, by using criteria of sustainability and local development". The first significant achievement of the trust was to sign an agreement with Gatzagak S.L.. For the first time in 900 years of history of the community of salt makers, Gatzagak donated the ownership of the crystallizers -in reality, it was a 90-year transfer of use- to the trust. This generous gesture had its support in their vision of salt heritage as a common, universal good. The trust is since then in charge of salt making in the valley and, in exchange, pays a 70,000 Euro yearly fee to Gatzagak for the use of the brine wells. Half of this amount is devoted to cultural activities, to disseminate the value of their heritage. Perhaps the best known event is the Salt Fair, a light and sound show in which the history of the valley is dramatized to the public. It is celebrated on the Saturday closest to St. Christopher, worshipped on the 10th of July. Also well-known are the feast of the start of the harvest in June and the *Fiesta del Entroje* (feast of the storage, sic) in September, in which the end of the harvest is celebrated. Among the institutions negotiating the use of the brine was the company Salinera de Añana, S.L., owner of a factory that obtained salt by cogeneration, located at the lower end of the valley. A satisfactory agreement was reached with its CEO.

During its first phase of management (2009-2012), the trust focused on the recovery of the salt making structures. The choice of methods and materials was done with exquisite care, following sound historical science (Landa & Lasagabaster 2007, Landa & Ochandiano 2002, 2014; Plata 2009, Plata *et al.* 2008). During this period, negotiations with stakeholders were slow and not always fruitful. There was a certain distance between the trust and the local community, which demanded more decision power in the process. Nevertheless, these efforts bore some fruits, in the form of prizes such as the Best Cultural Product of Active Tourism awarded by the magazine *Aire Libre* and the international tourism fair, *FITUR*, or the recognition of the Basque Academy of Gastronomy for the "project of recovery and sound use of the salinas of Añana within the socioeconomic context", both of them in 2011. At the end of this period, natural scientists also made some studies on invertebrates, vegetations and fossils found in the area (Alonso 2010, Sánchez-Fernández *et al*. 2007).

In 2012 there was a radical shift in the management of the trust, with the dismissal of Mikel Landa, replaced by Roberto López de Eguílaz, a journalist with a less technical and more communications profile. With him in office, the focus of the trust moved towards obtaining public recognition of its work. It had a stronger visibility in the press and in social media. There is a tighter tie with high-class chefs, which together accumulate 14 Michelin stars. They are

engaged to recommend the use of Añana salt in their public events and their restaurants. King Felipe VI (back then still the Prince of Asturias) declared to use this salt at home.

From then on all efforts were oriented towards consolidating the candidateship of the Valle Salado de Añana to World Heritage by UNESCO. The candidateship had been first resented by the Department of Culture of the Basque Government to the Council of Spanish Historical Heritage and was completed by the trust itself until the preliminary assessment by ICOMOS, in 2014. This assessment, to everybody's surprise, resulted in a negative advice. As a consequence, the trust decided to temporarily remove the candidateship, with the idea to improve it. Among the arguments explained by ICOMOS, was:

> "ICOMOS considers that the evolutionary socio-technical approach to the property's authenticity, including issues relating to the survival of a living technical heritage, is not fully worthy of consideration. Clearly this is an ambitious reconstruction project, based on good knowledge of the technical and social history of the salt works (intangible heritage), but whose tangible authenticity today has not been fully demonstrated. The reconstructions correspond to the layout of the earlier terraces thanks to the remains of the walls, but the other elements correspond to general types which are presented in an educational way rather than through a scrupulous heritage restoration (UNESCO WHC 2014)."

The negative evaluation by ICOMOS was a blow for all institutions involved, which had firmly believed they had a strong candidacy with broad popular support. Meanwhile, the trust continued working along the lines of cultural promotion and dissemination. Ever since, a great diversity of activities has been organised: Mountain races, renting the site as a film set, art installations, concerts… As a result of these efforts, Añana was chosen as a Presidium of the Slow Food movement or has obtained the third place in the Best Corner of Spain contest by the well-known Repsol touring guide, both of them in 2014.

A third period of management broke off in 2015, with the dismissal of Roberto López de Eguilaz, replaced in turn by Andoni Erkiaga, a former businessman with political ties to the Basque nationalist party. In his first declarations to the press after taking office, he promised to revive the candidateship of the Valle Salado de Añana to UNESCO's World Heritage programme.

The trust has now 11 full time employees (engineers, architects, a historian, an archaeologist, an ecologist and administrative staff) and contracts descendants of old salt maker's families, to work in the salinas during the productive season. The latter have more flexible contracts and are supervised by expert salt makers. In addition, there are five people working in the packaging and sale of salt. There is a variable number of guides during the tourist season, most of them students from the area. It also organises volunteer work camps for young people, during the summer. From September 2012, the trust cooperated with the Workshop School Micaela Portilla, located in the nearby town of Fontecha. They develop a joint programme to train young professionals in traditional crafts related to the recovery of heritage (carpentry, masonry…). The trust also hires specialised contractors for specific tasks.

Today, the trust generates an income that covers 40% of their yearly budget, thanks to the sale of salt and the guided visits. The rest of the budget is provided by the provincial government, complemented by the contribution of strategic collaborating institutions, such as the *Agencia Vasca del Agua* (Basque Water Agency) or the savings bank *Kutxabank / Vital*

and several European funds (Leader, Interreg…), brought in by the different trustees. The provincial government has promoted the participation of the Valle Salado of Añana in different EU-funded projects of the Interreg programme, namely SAL Salt of the Atlantic (2004-2007) and ECOSAL ATLANTIS (2010 – 2012). The most relevant result of both projects is the creation of the Traditional Salt Route of the Atlantic, a network of traditional salt making sites of the European Atlantic area. The main goal of this route is to enhance a sound eco-touristic use of its heritage.

The visitor programme of Añana is an ever growing activity, with 45,000 visitors in 2015. The touristic offer ranges from regular guided tours to specialised tours for schools or special interest groups. Visitors can also book brine foot or hand baths and soon there will be a *flotarium* available. The former Santa Ana storage building has been prepared as a multipurpose hall, capable of hosting events of all kinds (course, conferences, concerts…). The trust also has activity beyond the physical scope of the salinas, with presence in fairs, symposia and conferences about different themes of interest and in technical and popular publications. Thanks to these efforts, the interest in this kind of heritage has reached beyond the region and visitors come from distant areas (3% are foreigners and 3% come from outside the Basque Country). One of the challenges ahead is to control the high demand in certain times of the year, to protect both the monument as the visitor's perception. Other aspects pending to be solved are parking space and facilities to eat in the area. The situation is being gradually improved.

5.4.2 Poza de la Sal (Burgos)

General view of the diapir of Poza, with El Castellar in the centre (©Katia Hueso)

Detail of the Granja de Rusalado in Poza (©Katia Hueso)

One of the restored temporary storage huts, next to a crystallizer (©Katia Hueso)

Sprinkling brine on the crystallizer, in the traditional way (©Narciso Padrones)

Figure 5.8: Images of Poza de la Sal

After the general privatisation of the salt market, the salinas of Poza de la Sal started suffering the strong concurrence from the nearby salinas of Añana, a mere 60 km away, which seemed to have a better capacity to distribute their salt (de la Cruz 1992, Echevarría 2009). The recent construction, in 1859, of the railway line Santander-Mediterranean, that should link the harbours of Santander and Valencia, two major hubs in Spain, brought the cheaper coastal salt to the area (del Castillo 2012). The decline was slow, but in the 70s the two last productive sections or *granjas* -Rusalado and Lines- are finally abandoned. In this period of imminent abandonment, during the last years of Franco's dictatorship (1939-1975), one local powerful family registered the whole of the saltworks to their name in order to transform the site into an industrial saltworks. Their project never took off the ground, but shattered the relationships among the owners.

A decade later, in 1980, Poza de la Sal gained some notoriety as the place of origin of the very famous naturalist Félix Rodríguez de la Fuente, after his death in an air crash while shooting a documentary in Alaska. Many fellow townsmen felt then that they had lost a person of reference, who should have defended the interests of the heritage of Poza de la Sal. Later that year, Benito del Castillo, founded the *Asociación de Amigos de Poza de la Sal* (Association of Friends of Poza de la Sal), which was later transformed into the *Asociación de Amigos de las Salinas de Poza* (Association of Friends of the Salinas of Poza).

In those years, the first steps towards the recognition of salt heritage were taken. The diapir of Poza de la Sal was declared a Site of Geologic Interest in 1983. A year later, Benito del Castillo defended his doctoral thesis in the Faculty of Pharmacy of the Complutense University in Madrid, on the nutritional and economic aspects of the salt from Poza. In 1989, the biologist and scientific illustrator, Eduardo Sáiz, publishes his seminal work, *Las salinas de Poza*, an ethnographic study with abundant illustrations and detailed descriptions on the traditional salt making process that quickly becomes a reference book on the area (Sáiz 1989; see also González 2009, Sáiz 2007, 2008).

In spite of this, the threats to the landscape Poza keep coming up, a cause of permanent concern for the Association of Friends of Poza. In the mid-nineties, there was a growing interest in exploiting the ophite outcrop in El Castellar, which arises in the centre of the diapir. The association conducted a study of the flora of the environment, discovering several endemic species, and thus managed to paralyze the project of the ophite quarry. Some also wanted to take advantage of the characteristic profile of El Castellar to carve the silhouette of Félix Rodríguez de la Fuente, an idea that was also rejected. Another threat to Poza de la Sal was its identification as a suitable place for the installation of a nuclear graveyard. Thanks to the opposition of the local community and with the support of environmentalist groups, Poza de la Sal was removed from the list of potential sites for this purpose, although this was not confirmed until ENRESA[74] published the list in 2010. In the late nineties, the installation of a wind farm on the edge of the diapir was planned, with 133 wind turbines. Thanks to the allegations prepared by different institutions and to the fact that the request to declare the salinas as BIC was already initiated, it was possible to move the park to a higher elevation, on the moorlands beyond. The wind farm was built in 2001 and provides nearly half of the municipal budget of Poza de la Sal.

A few years later, in 1999, the Association of Friends of the Salinas of Poza, a legacy of the Association of Friends of Poza de la Sal, is formed. This association, under the chairmanship of Pablo Puente first and Narciso Padrones later, played a leading role in the acknowledgement and recovery of salt-related heritage assets that would take place later (Moro 2014). Their work was decisive in declaring the salinas and its surroundings as a BIC under the category of Historical Site in 2001. At that time started the refurbishment of the Interpretation Centre "Las Salinas", located in the Administration House of the Royal Saltworks, and finally opened in 2003. Prior to that it functioned as a cultural centre, and still holds this function. The centre houses a large exhibition area on the salt making area, the diapir and a small collection of farm tools. It has an exhibition hall and several classrooms on the upper floors. There is also an office / reception with publications on Poza de la Sal for sale.

In 2005, the Directorate General of Historical Heritage of the *Junta de Castilla y León* (regional government), under the direction of Enrique Sáiz, commissioned the studio *Planz S.L.* in Valladolid to draft a Master Plan for the Salinas of Poza Plan and its surroundings. The plan was drafted by a multidisciplinary team of geographers, ethnographers, geologists and biologists, under the coordination of architect Gregorio Vázquez. The plan consists of three phases: Protection and conservation, location of uses and activities; management and public use as well as an ambitious number of actions for the use of natural and cultural heritage of the town and its salinas.

[74] ENRESA is the Spanish national organisation in charge of the management of radioactive waste. It regularly publishes a list of potential sites for the storage of low-risk radioactive waste.

As a result of institutional contacts made within the framework of the Master Plan, the first meeting of Traditional and Inland Salinas was organised, by initiative of the Association of Friends of Inland Salinas and with the support of the regional government, the municipality of Poza, the Association of Friends of the Salinas of Poza and the SEK University Trust. This first meeting took place in 2005 in Poza de la Sal and culminated in the "Declaration of Poza" in favour of the culture of traditional salinas. These meetings were repeated annually, shifting the venue between Poza de la Sal and the biennial Arts and Heritage Fair *ARPA*, held in Valladolid (Hueso & Tejedo 2007). The meetings accused the lack of resources, suffering a 6-year break, and were resumed in 2014, also in Poza de la Sal. They were renamed as the Meeting of Iberian Traditional Salinas, in order to accommodate participants from Portugal and some traditional salinas from the coast. In the 2014 edition, the Iberian Network of Traditional Salinas (RIST) as created, with the aim to bring together artisanal salt producers and any other person or institution interested in traditional salt culture, in order to disseminate and promote discreetly this activity.

In 2012, Poza de la Sal joined the candidacy of Salinas de Añana to become a World Heritage Site by UNESCO, as "associated heritage." Some experts criticized that Poza was accompanying Añana, rather than the other way around, since it was the latter that historically depended on Poza (de la Cruz 1992, Echevarría 2009, Sáiz 1991). Others argued that Poza de la Sal was not adequately prepared to meet the criteria of UNESCO. Anyway, the candidacy of Salinas de Añana -and therefore of Poza de la Sal was withdrawn in 2014, after a negative assessment by ICOMOS experts. The same year, the press published the news of a proposed to build a spa in the salinas, but ultimately it was never executed. The fact that the salinas were already a BIC, prevented to locate the project within the salinas, as the promotor had planned.

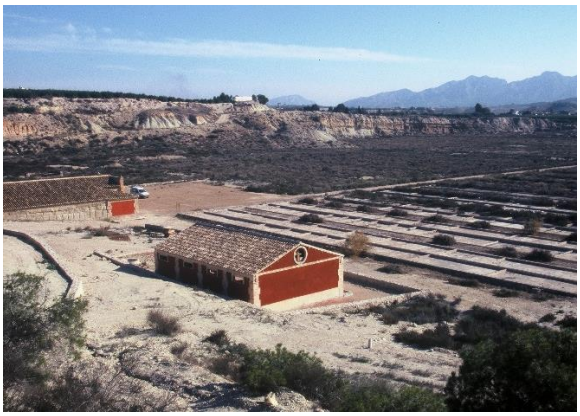
The salt mines of Poza de la Sal were incorporated in 2014 to the Traditional Salt Route of the Atlantic, founded by the partners in the European Interreg ECOSAL Atlantis project and open to salt making sites from both European Atlantic regions as well as adjacent areas (Navarra, Castilla y León ...).

As noted earlier, it is not possible to understand the history of the recovery of salt heritage in Poza, without knowing the role of the Association of Friends of the Salinas of Poza. Many of the research, rehabilitation, improvement and dissemination tasks of the salinas have been achieved thanks to the volunteer work of its members; others by organizing work camps, financed from very diverse sources. Among others, they have managed to gradually make maintenance works and annual cleaning and restoration of several elements of the salina, which has allowed to get a modest harvest of salt every year. The association has also repaired and signposted the local path SL-BU-67 "Ruta de Las Salinas" (linking the salt storage buildings of Fuente Blanca, La Magdalena, Trascastro and the mediaeval castle), with a length of about 6 km and a relatively easy path. In 2014, they obtained a grant for the recovery of a brine storage basin for the protection of the native species of the brine shrimp *Artemia parthenogenetica.* Back in 2006, the association had already received the 4th Award for Cultural Heritage of the Chambers of Commerce of Castilla y León, in recognition of their work.

Many of the actions that the association has developed have relied, at least conceptually, on the Master Plan. However, funding from the different administrations has come slower than expected. Projects have had to be managed independently, without ensuring the continuity or consistency marked by the plan. Therefore, the recovery actions undertaken by the association have had to respond more to the availability of existing economic, technical and human resources at each moment. Aware of this limitation, the Association of Friends of the

Salinas de Poza developed in 2015 a "Restoration project of the Salinas de Rusalado", in order to plan a more integrated recovery action for one independent productive area, and display it to the public as a whole. The municipality of Poza de la Sal, owner of this area (granja de Rusalado), requested the association to solve this task.

5.4.3 Rambla Salada (Murcia)



General view of the Rambla Salada salt making site, with the former storage buildings in the centre-left (©Katia Hueso)

Detail of the salty stream, the *Rambla Salada,* which provides brine to the salina (©Katia Hueso)

Restored brine storage basin in Rambla Salada (©Katia Hueso)

Collecting *fleur de sel* in Rambla Salada (Coll. Miguel Ángel Núñez)

Figure 5.9: Images of Rambla Salada

Little is known about the history of the site before the privatisation in 1869. In the early twentieth century, part of the salinas –the so-called *Orden de los Valencianos*– was leased to herders from the province of Teruel, who were wintering in this area and produced their own salt. The saltworks were owned by Antonio Hernandez and José Burgadola until 1950. Upon the demise of the latter, his son and only heir acquired the other part. From that moment on, the decline in production began, and the salinas were then sold to a farmer of the property, José Mayor, also known as *El Periquito*. He in turn sold them to Pedro Buitrago, from whom they are finally purchased by the Directorate General for the Environment of the Region of Murcia, within the context of a European project of the LIFE programme, in 1997.

In the 40s, a group of houses and swimming pools was built, taking advantage of upwelling hot springs in Fortuna, in an area known as Baños de Rambla Salada, part of the same geomorphological system. At that time, the holiday of the Virgin was typically celebrated on August 15, when hundreds of people arrived in the area from across the province and even neighbouring provinces. They were staying both in the new houses as well as in cave houses that were already in the area. These were the only salt springs in the province open to the public for bathing, with a salinity of 150 g / l (five times that of seawater). Today, this area has

disappeared under the waters of the reservoir of Santomera, although the custom to exploit mineral and medicinal properties of the water in nearby areas still pervives (e.g. in Baños de Fortuna) (Lillo & Lisón 2002).

Given the natural values of the wetland, many institutions have expressed an interest in their study and conservation. The University of Murcia has developed several limnological, botanical and zoological studies of the wetland for over a decade, the result of which have produced a set of ecological indicators of reference (Arribas *et al.* 2009, Millán *et al.* 2009). On the other hand, the University of Granada has studied the microbiology of the salinas and found a species of bacteria thus far known only from the bottom of the sea, serving as an evidence of the geological past of this enclave. The bacterium in question also has an interest for its potential biotechnological applications (Luque *et al*. 2012). Among the conservation actions performed in Rambla Salada, was the participation of the wetland in two European projects of the LIFE program. One of them, developed during the late nineties, aimed at the conservation of steppe and saline areas of Murcia and financed the rehabilitation of the storage building as a visitor centre. The other, which took place in 2008, was devoted to the recovery of the Iberian toothcarp (*Aphanius iberus*), a threatened fish typical from saline areas in the region of Murcia, and allowed the recovery of the basins. The Association of Naturalists of the Southeast, ANSE, collaborated in many of these research and conservation tasks (Martínez & Moreno 2001, Núñez 2008, Núñez *et al.* 2006, VVAA 2003, 2007).

Perhaps less well known is the cultural heritage of the site, a duty dealt with in recent years by the Association of Volunteers for Rambla Salada *La Carraca*, established in 2006 (Núñez 2008, Núñez *et al.* 2006; see also on a broader, regional scale, Gil *et al*. 2010, Gil & Gómez 2010, Gómez *et al*. 2010). The regional authority, owner of the site, has reached a land custody agreement with this association to manage the natural and cultural heritage of the property. The agreement is based on the development of the project *Eras de la Sal*, whose objective is to study the social dynamics of the environment and to monitor the ecological indicators of the protected landscape. The efforts of Miguel Ángel Núñez, president of the Association *La Carraca,* also highlight the great educational potential of saltscapes of Murcia, from different points of view (biodiversity, engineering, ethnography, history ...). Today, there is a visitor program that welcomes groups on demand. For this purpose, different infrastructures and equipment have been set in place during the early 2000s. These include the Visitor Welcome and Information Centre, located in a salt storage building, which includes a hall with interpretation panels. The association also offers nature workshops for schools as well as environmental volunteer activities, at different times of the year. Among the latter are the summer camp for the maintenance of the salinas, which culminates with the harvest of salt (Núñez & Hernández 2007).

The Department of Historical Heritage of the Region of Murcia initiated in 2014 the process of declaration of BIC, with the category of Place of Ethnographic Interest, for the salinas of Rambla Salada (Melgares 2005; see also Pozo 1995). Two years later, in 2016, it was officially been declared BIC.

5.4.4 Gerri de la Sal (Lleida)

General view of the Roser section, with the brine storage basins in the foreground and the river Noguera Pallaresa on the back (©Katia Hueso)

Detail of the crystallizers with the hut sheltering the brine well in the back. The road has now a section overhanging the salinas (©Katia Hueso)

Interpretation panel and meeting point for visitors to the salina, to be seen in the back (©Katia Hueso)

Moving the brine to accelerate the evaporation (©Katia Hueso)

Figure 5.10: Images of Gerri de la Sal

From 1831 to 1873 all Catalan salinas belonged to a private company, *Empresa de Salinas*, which hoped to improve the distribution and sale of salt. However, during this time, the salinas of Gerri routinely suffered thefts and production was very irregular. With the general privatisation of the salt market in 1869, the salinas remained in the hands of its former owners, who were awarded collectively, by auction, both the storage building as well as the concession to exploit the brine spring (Calvet 2002, Falguera 2002, Sancho i Planas 2008). The number of hours traditionally awarded to each owner to tap brine, were translated into the shares each individual owner obtained within the cooperative, summing a total of 1,912 shares. This entity, under the name *Comunitat de Fabricants de Sal* (Community of Salt Makers), governed the salt making activity until the final abandonment of the salinas. The activity has always remained artisanal, thorough details on the process as well as on the recent history can be found in the works by Oriol Beltran (Beltran 1988a, 1988b, 1990, 1991, 1993, 2007a, 2007b, 2008; Beltran & Farré 2007).

Until 1928 the salt was harvested in alternate years, although it was decided to increase productivity to one yearly harvest, in order to lower the maintenance costs. This rate was kept until 1950, although the production figures suffered large variations from one year to

another. In the second half of the twentieth century the decline became evident and the activity was gradually abandoned. The floods of 1907 and 1937 had already caused the loss of a part of the salinas, but the larger flood that came in October 1982 inundated a large portion of land, destroying most of the production facilities of La Teulera area. A small part of the salinas, in the area of Raval del Roser, disappeared sometime later, to build a municipal parking lot. In this area there was still a minimum productive activity, which stopped in 1990.

Between 1994 and 1996 different studies were devoted to the inventory of heritage in Gerri de la Sal and its region, and various proposals for the use of the salt storage building were elaborated. Perhaps this became the seed that led to the declaration of BCIN[75] for both the salinas as the *Real Alfolí de la Sal* (salt storage building), in 1996. However, a few years later, in 2001, the High Court of Justice of Catalonia judged in favour of an appeal by a private individual, requesting to declassify the salinas as a whole from their category as BCIN, and left only the salt storage building protected under this instrument.

Following the declaration as BCIN little happened on the ground, so new proposals were made to recover the salt heritage of Gerri, both in 1997 as in 2001. Perhaps the most relevant of them was made by Josep Maria Mata-Perelló, of the Polytechnic University of Catalonia (Mata-Perelló 2001, 2003). His idea was to create a geological and mining park for the two Pallars neighbouring counties, to which Gerri de la Sal belongs (Pallars Jussà and Pallars Sobirá), following the example of the Riotinto mine park in Huelva. He believed that the area gathered enough geological and mining attractiveness. He also proposed that the salt storage building should harbour one of the interpretation centres of the park.

Between 2003 and 2006, the municipality of Baix Pallars rehabilitated the salt storage building, with a budget of 600,000 Euro partially covered by the *1% cultural* fund provided by the Ministry of Public Works and stemming from the budget of large infrastructure works in the area. The restoration was performed under the technical direction of the architect Elena Belart. Initially it was going to open with the name of *Casa de la Sal*, but in 2006 a network of museums of the *Museu de la Ciencia i de la Tècnica de Catalunya* (mNACTEC; Catalonian Museum of Science and Technology) and finally was able to open its doors in 2012 under the name of *Museu de Gerri de la Sal*. The mNATEC is concerned with the recovery and conservation of the industrial heritage of Catalonia and its headquarters are in Terrassa. It has a network of 25 museums, to which the Salt Museum now belongs. Its exhibits include and explanation of the former functions of the building itself and how salt production in Gerri de la Sal and in other parts of the world was done, with the support of various audio-visual aids. There are numerous critical voices on the rehabilitation of the building itself and the contents of the museum. The design of the museum, which had an additional budget of ca. 500,000 Euro, has a very generic narrative and relies more on the audio-visual aids than tangible, site-specific objects and themes. Some consider it too poor, while others believe that the majesty of the building stands out better with an even more minimalist exhibition. In any case, a few years after its inauguration, both the building itself and the museum installation, especially the audio-visual equipment, began to suffer the consequences of the salt that is impregnated on the walls and floor. The visitors themselves, in view of the amount invested in the building, are surprised that no part of it has been used to recover the salt production in the salinas, a few metres away (Beltran & Farré 2007).

In 2012 there was an opportunity to qualify again for the *1% cultural* fund, associated to the budget of roadworks of the N-260, which passes through Gerri: it was namely planned to by-

[75] BCIN or *Bien Cultural de Interés Nacional* (Good of National Cultural Interest) is the Catalan version of BIC, the legal instrument in force in the rest of Spain

pass the village with a tunnel. The Catalan government had committed to supplement the amount contributed by the *1% cultural*. However, the works were paralyzed and no aid from any of the two institutions was obtained. This had the advantage that the tunnel was finally not excavated, which would have had unpredictable consequences for the brine source.

Since the opening of the museum, the municipality of Baix Pallars organizes guided tours to the building and the salinas. Similar visits are also included in different packages, such as *PassaPorts*, which offers discounts in fifteen Pyrenean ecomuseums, or in combination with the *Tren dels Llacs*, a tourist train that runs between Lleida and La Pobla de Segur, from where different excursions are offered. The visits to the salinas are led by two salt makers still active in the area and who have intermittently produced salt since the early 2000s. Given their age, they are now seeking the replacement by any young family willing to take over.

While the public waited for the museum to be opened, the Directorate General of Architecture and Landscape of the Catalan government commissioned to draft a Strategic Plan for the Recovery of Salt Making Activity in Gerri de la Sal in 2008. This plan focused on new ways of commercial exploitation of the salinas and included obtaining salt during the winter by means of cogeneration. It added the possibility of building a spa, with swimming pools and hotel accommodation. Although this plan ultimately did not develop, it is still alive among residents, with a mixture of relief and nostalgia. In this document, heritage was clearly a secondary issue, as it only foresaw the completion of a study on the heritage and landscape of the region, to be made within six months. A new version of the plan re-emerged in 2014 with the possibility of developing a business project around artisanal salt production, but the potential partners of the project were not able to promote it adequately, so it has been postponed *sine die*.

5.4.5 Salinas de San Juan (Guadalajara)

Partial view of the Salinas de San Juan, with a recent salt harvest (©Katia Hueso)

Protected halophyte communities at the edge of the salinas (©Katia Hueso)

Restored brine well house (©Katia Hueso)

Partially restored brine well (©Katia Hueso)

Figure 5.11: Images of Salinas de San Juan

The salinas de San Juan became, as all the others, private property in 1869. No information is available about their evolution until the Spanish Civil War, when they suffered serious damage. However, the site remained active, with changes in ownership and fluctuations in production until 1981, when it was finally abandoned. Historical references are sparse, but show a long lasting salt making activity in the area (García-Soto 2006, García-Soto & Ferrero 2006, 2007; Gismera 2016). The salt has always been obtained by hand here (Carrasco & Hueso 2006a, 2006b).

In 2003 the *Fundación Naturaleza y Desarrollo* (FUNADER; Nature and Development Trust) was founded by the mayor and the town secretary of Saelices de la Sal, plus four other individuals. The objectives of the trust were the conservation and restoration of cultural heritage assets of Saelices de la Sal; the conservation and protection of the environment; the promotion of the economic and social development, and the dissemination of cultural, natural and environmental values of the area, always with special emphasis on the historical values. The trust then purchased the salinas from its owner, in order to recover them in the near future.

Thus, in 2005 a project on the recovery of the salinas of San Juan in Saelices de la Sal was initiated under the Restoration of Ecological Systems programme of the former Ministry of the Environment, starting with a budget close to one million Euro (Molinero 2010). In a first

phase, which lasted until 2009, the *partido de arriba* of the Salinas de San Juan, that is, the section further away from the village, was restored. In this phase, the elements needed for the functional operation of the salina were recovered. This allowed the maintenance of adequate levels of brine to preserve the aquatic bryophytes present in the section below the salinas, in the so-called *partido de abajo*. In this project, besides the Ministry of the Environment, other stakeholders were involved, namely representatives of cultural and environmental issues of the regional government thet *Junta de Castilla - La Mancha; FUNADER;* scientists and experts from the Royal Botanical Gardens; *SEHUMED*, an NGO specialised in Mediterranean wetlands; *CENEAM*, the National Center Environmental Education and the *Association of Friends of Inland Salinas*, plus some freelance architects and archaeologists. In addition, the nearby *Ermita del Carmen* and the salt storage building were restored with *1% cultural* funds. The initial idea was to use the latter as a museum and visitor reception centre, but the funding was never completed and only the building itself was restored. Ironically, today it fulfils its original function, which is to store the salt produced in the recovered salinas. The second phase of the project planned to rehabilitate the *partido de abajo* of the salina, but never got done.

Just when the restoration project began in the summer of 2005 there was a wildfire in the vicinity of the salinas, which began in the neighbouring municipality of Riba de Saelices and burned 10,000 hectares of forested areas, of which one-fourth were within the Natural Park Alto Tajo. It was also particularly tragic because of the loss of eleven firefighters, causing a great impact in the Alto Tajo area as a whole. However, the fire did not directly affect the salinas or the municipality of Saelices, nor it had an impact on the financing of the rehabilitation project.

By initiative of *FUNADER*, two years later, the *Salinas de Saelices* was declared BIC with the category of Monument. Meanwhile, the Natural Park Alto Tajo designed in 2006 a series of *Georutas* or routes that ran through the geological, geomorphological and ethnographic heritage of the protected area (Carcavilla *et al.* 2008b; for other natural heritage values in the site, see also Calvo *et al.* 2013, Hueso & Carrasco 2008b). One of them, the *Georuta* 2 "Rocks, vegetation and landscape" runs through the salinas on their way from the Riba de Saelices to Saelices de la Sal. The park itself was incorporated in 2014 to the Global Geopark Network of UNESCO, an honorary distinction for territories that have a remarkable geological heritage, which is conveniently preserved and used for local development. Also in 2014, the *Geolodía*, an initiative to disseminate geological heritage by the Geological Society of Spain and held every year in most provinces of the country, visited the salinas of Saelices.

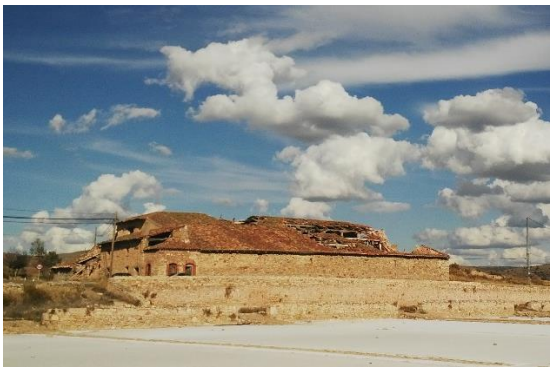
The salinas are also recognized as one of the typical Celtiberian landscapes within the initiative *Territorio Iberkeltia*. This initiative combines several regions of Castilla y León, Castilla–La Mancha, Aragon and La Rioja, to develop joint strategies and inter-regional cooperation projects, with the theme of their common Celtiberian past.

The region of Molina de Aragon - Alto Tajo has prepared a Sustainable Development Plan in 2011, but the document does not specify any action in the salinas of San Juan. In 2013, an agreement between *FUNADER* and the provincial government of Guadalajara to support the production of salt, resulting in a first harvest later that year. The harvest was then used for road de-icing, although *FUNADER* is considering the possibility of obtaining salt for other purposes, including the production of *fleur de sel*.

5.4.6 Salinas de Imón (Guadalajara)

Partial view of the Salinas of Imón, with a brine well house on the left (©Katia Hueso)

Detail of a concentration basin, with the guard house in the background (©Katia Hueso)



Deteriorated state of the storage building of San José, one of the three found in Imón (©Katia Hueso)

Guided visit to the salinas, in front of the storage building of San Antonio (©Katia Hueso)

Figure 5.12: Images of Salinas de Imón

In 1873, four years after the privatisation of the salt market, the salinas of Imón and La Olmeda, were acquired by a group of 13 businessmen who divided the property into 15 parts, forming the so-called *Condominio de Propietarios de las Salinas de Imon y de La Olmeda* (the details of which have been explained earlier in this chapter). They were presumably impressed by the historical importance of the site and, above all, attracted by its potential for trade (Donderis 2013, García-Contreras 2009, Malpica & García-Contreras 2010, Morère 1991, Ortego 2013). Of diverse trade and geographical origin, these owners managed the salinas at a distance and delegated on labourers, foremen and other specialized workers the production and sale of salt. Over time, some of their heirs lost interest in the business and were becoming mere shareholders, who once a year received the revenues of salt after their annual meeting, but did not make great efforts to adapt their activity to the changing times. From the mid-twentieth century, the salt market was losing profitability for inland salt. Equal to other cases, the arrival of the railroad in Sigüenza –16 km to the south of Imón– in the end increased the penetration of cheaper, industrial coastal salt in the area. As a result of this lack of profitability and given the conservative attitude of its owners, who refused to invest in improvements, the site was gradually deteriorating, but it managed to have an annual harvest until 1993 (Donderis 2013, López de los Mozos 2013).

A few years after the approval of the Spanish Historical Heritage Act in 1985, the journalist and writer Santiago Amón promoted the declaration of BIC for Salinas de Imón, which in his opinion it deserved. It is unknown why he failed to do the same for Salinas de La Olmeda, which then formed an indivisible historical site since the twelfth century, with similar architectural and technical value, fully justifying a possible joint inclusion (Carrasco & Hueso 2008b, García 1983, Hueso 2006, López-Gómez 1970, Trallero *et al.* 2003a, 2003b). Thus, in 1992, the Salinas de Imón were declared BIC with the category of Monument category, by the still young *Junta de Castilla - La Mancha* (regional government). The owners were notified upon approval and thereby acquired the duty to maintain an agonising facility that suddenly had become a monument, and did not receive any official support for it. Without such aid and with a fading income, the necessary maintenance of the monument was never done, neither did the public administration act *ex-officio*, as prescribed by the Act.

It was not until 1996 that, within the frame of two consecutive work camps for young volunteers, small containment and restoration works were made, which managed to temporarily halt a fraction of the deterioration already evident in the site's facilities. These works, including the still visible restoration of the porch of the San Antonio storage building, were the result of a rare collaboration between the owners, the regional administration and the municipality of Sigüenza. These work camps were not celebrated again.

After the last harvest, the storage buildings were still filled to the brim with salt, a fact that drew the attention of the company *Agrosa*, specialized in the manufacture and distribution of agrochemicals. *Agrosa* leased the salinas during the period 1997-2002, to sell that salt. In 1998, both this company as the owners, prepared two project proposals for the recovery of the salinas, based on a mixture of tourism and salt production, but they never got to see the light. Around that time, the possibility to develop a cogeneration project to produce salt in La Olmeda was discussed, but was never finally developed. During their period in the salinas, *Agrosa* did some maintenance work and improvement of facilities, especially the storage buildings.

Although the Salinas of Imón and La Olmeda have always aroused academic interest, with outstanding works of geographers and historians (e.g. Morère 1991, García Contreras 2009, López Gómez 1970, Malpica & García Contreras 2010, Ortego 2013), in the 2000s the Salinas de Imón began to draw the attention of other scholars mainly architects, designers and heritage-interested people. As a result of this interest came the book Las salinas de la Comarca de Atienza, coordinated by Antonio Trallero, which still is the best reference work on these salinas (Trallero *et al*. 2003a, b). In 2001, the San Antonio storage building hosted a course on the recovery of the rural heritage, with a speech delivered by leading designer Luis Sardá. It was an inspirational setting that set the grounds of the movement in defence of the salinas. The following year another similar course was held, in which the students used the salinas as a stage for designing heritage recovery projects. Many of the people involved in these initiatives, became the founding members of the *Association of Friends of Inland Salinas*, which started its activity in 2002. The formal presentation of the association took place on a cold December morning in Sigüenza, but nevertheless managed to bring together more than eighty people, an indicator of the interest that existed in the region for this heritage. The next year, the Association organized a summer course in collaboration with the University of Alcalá, plus an exhibition of graduate students work of the Higher Technical School of Architecture of the Polytechnic University of Madrid, showing the drafts of salt heritage recovery projects. The Association also initiated a joint proposal for the recovery salt heritage with Greek partners from the island of Samos, to be presented to the LIFE programme, but never got to be presented due to lack of interest from the local and regional administration in Sigüenza and Castilla-La Mancha. On the other hand, the owners seemed relatively

receptive to this shift towards a heritage activity and drafted the "Preliminary study of the multi-project of the Salinas de Imón and La Olmeda", which included an interpretation centre, a centre for art exhibitions and a film school, but given the lack of private funds, the collaboration of local and regional authorities was needed. The authorities did not support the idea, arguing that it was a private facility and a structural lack of funds on their part. However, the regional authorities in charge of environmental issues decided to support some minor initiatives of the Association, such as leaflets and books about the salinas and their natural environment. This allowed to disseminate the natural values of the areas surrounding the monument. More recently, the salinas of Imón joined the list of "100 Items of Industrial Heritage" included in the National Industrial Heritage Plan prepared by the Ministry of Culture in 2011. In those years, ethnographic, historical and bibliographical research was performed in the area, with the financial support of different institutions, but they failed to have an influence in the evolution of the salinas (Carrasco & Hueso 2006a, 2006b; García-Contreras 2010, García-Soto 2006, García-Soto & Ferrero 2007, Gismera 2016, Malpica & García-Contreras 2010, Morales 2016, Trallero *et al*. 2003a, 2003b).

In the mid-2000s, some movement arises again around the salinas. New lease and even purchase offers are presented to the owners, by at least one company from Guadalajara and a financial investor from Madrid. The latter finally refrained because they failed to gather enough funds to outbid the company. His representative, in an almost simultaneous ceremony in the summer of 2006, leased the salinas and then acquired about 90% of the shares of the condominium. Ever since there have been changes in the distribution of the assets of the company[76], and another one created *ad hoc, Salinas de La Olmeda, S.L*. now leases the facilities. This is thus in practice the entity that runs the management of the condominium and therefore the salinas. In 2008 a Master Plan for the salinas was prepared, commissioned by the company and signed by architect José Juste Ballesta, also author of the Master Plan of the Cathedral of Sigüenza. The plan has not been released to the public and little is known about its implementation (Hueso & Carrasco 2013).

In the midst of the global financial crisis, there seems to be an important activity in the salinas and the deterioration of the monument is visibly accelerated. In a few years the already damaged roofs of the San Antonio and San Jose storage buildings, collapse. The company decided to remove the salt accumulated spontaneously in the basins over the years and uses heavy machinery for this purpose, thereby severely damaging the floors of the crystallizers, brine storage basins and stone paths. Finally, in 2012, together with other partners, a project on the industrial use of brine in Imón is presented to the authorities. To this end, and being illegal to significantly modify the site protected as BIC, the company purchased some land nearby[77] and built a complete new salinas with industrial criteria. It consists of two large basins with a total surface of 13 hectares. The brine is now brought via PVC-pipelines from the protected site's wells to the new site. After obtaining the necessary permits and overcoming the environmental impact assessment procedure, the company began operations in 2014. *Salinas de La Olmeda S.L*. is today producing salt by industrial processes and some social agents openly show their satisfaction with the recovery of the "salt industry" in the region, perhaps misled by the inflated expectation of the jobs to be created in its wake.

[76] The *Condominio de Propietarios…* declined to participate in an interview. The exact composition and structure of the condominium and the companies owning most of its assets and leasing the facilities, are highly complex and opaque. The situation seems also quite volatile, given the fact that there have been many changes over the last decade.

[77] Strategically squeezed between the portion of salina protected as BIC and the portion of neighbouring land protected as Natura 2000.

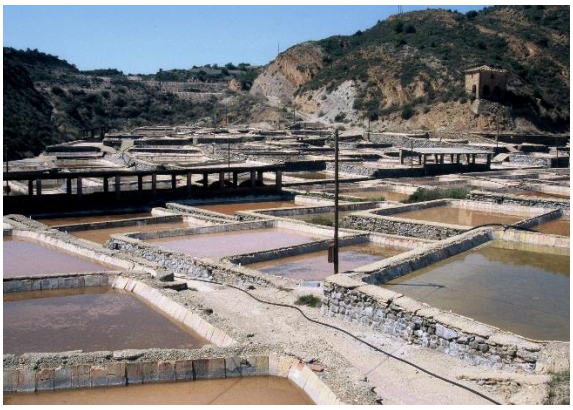
Few if any compensation measures towards the protection or recovery of the site's heritage have been taken, due to the fact that the resulting environmental impact statement was too vague and relieved the company from this task. The surrounding landscape has not been protected, either.

In 2015 the management plans of the Natura 2000 sites were developed, including the SCI / SPA "Valley and Salinas del Salado" which adjoins the monument. In the management plan the importance of artisanal salt making was mentioned as a means to preserve adequate salinity conditions for halophytes species that are protected here. Artisanal salt making was considered, in addition, as an excellent means for the recovery, in part at least, the salt monument.

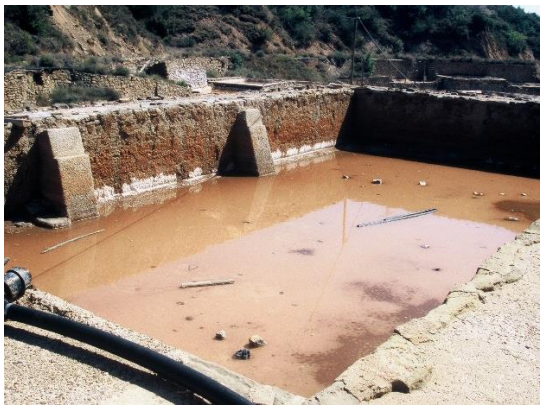
The owner company and its partners are focusing all their efforts on the industrial project. There is no known plan to invest resources in opening the site to visitors, not even to organize guided visits without any infrastructure. A proposal to collaborate in this field with the Institute of Saltscapes and Salt Heritage (previously Association of Friends of Inland Salinas) was duly dismissed. The company does not explicitly authorize or prohibit access to visitors but is developing a plan to regulate vandalism and looting by uncontrolled visitors, which have been encountered in the salinas. Therefore, a heritage recovery plan for the site seems very distant today. Visitors have to be satisfied with seeing the monument from the nearby hill of Imón or stop and read a brief interpretive panel that the provincial government of Guadalajara placed some time ago in front of the San Antonio storage building.

The public, on the other hand, still shows an interest in salt heritage. The salinas were protagonists of the European Heritage Days held in 2014 and were important focus point during the mediaeval archaeology congress held in Sigüenza in the summer of that year. The local tourist office offers information to all visitors who are interested in them, but cannot offer in situ experiences, as many a visitor would wish. In general, residents and visitors have a mixed feeling of indifference and impotence, because the only thing that seems clear is that the monument will not be recovered in the short or even medium term.

5.4.7 Salinar de Peralta de la Sal (Huesca)



General view of the salinas of Peralta, with the watch tower in the background (©Katia Hueso)



View of a brine concentration basin (©Katia Hueso)

Detail of the crystallizers with the typical bricks and stones (©Katia Hueso)

Information panel at the entrance of the salinas, full of graffiti (©Katia Hueso)

Figure 5.13: Images of Peralta de la Sal

Little is known about the historical salt production in Peralta de la Sal after the privatization in 1869. It was then the property of a consortium of owners, the *Mancomunidad del Salinar*. In 1983, most of its members sold their property to Luis Porté, a representative of the company *Salpura S.A.* and current owner. *Salpura*, through a shared operation with the company *Agroper S. Coop.* which rented the site, modernized the facilities (Castillón 1985, Falguera 2004, Fuster & Tomás 2008). The brine well was deepened to guarantee a more abundant and constant brine supply, which increased the harvest from 300 annual tonnes to more than 5,000. The distribution of salt went beyond county level and spread throughout Aragon, Catalonia and exporting (as it used to do in the past) to other companies in the south of France. Other changes introduced by the new owner were the replacement of wooden pipes by PVC piping and the mechanization of the brine pumps. The salt was collected in the crystallization basins with walking tractors, so it was hard not to break their pavement, and the salt came out polluted with small particles. The transportation of the salt within the salina was made with mechanic conveyors and a warehouse at the entrance of the salina was constructed to facilitate storage. Although the machinery seemed to facilitate the work, it was ultimately more expensive due to the fast corrosion suffered by the metal and rubber parts in contact with salt. Furthermore, the arrangement and size of the crystallization basins made it difficult to work this way. Thus, the modernization plan worked for a couple of decades, but the salt ceased to be profitable in the conventional market and the final closure came in 2000 (Fuster & Tomás 2008).

In 2006, the regional government of Aragón began the process of declaring the "salinar de Peralta" as a BIC, culminating a year later, within the category of site of ethnographic interest (Mata *et al.* 2013). In spite of this, there was no change in the management of salinas, which at that time were already inactive. Perhaps this explains that, in 2011, the deputy of IU (*Izquierda Unida*, left-wing party) for Upper Aragón, Miguel Aso, visited the site with several representatives of IU of the county La Llitera to check the situation. Noting the deterioration of the facilities, the parliamentary group of IU in Las Cortes de Aragón, the seat of the regional government, asked two parliamentary questions to the head of the department of Education, University, Culture and Sports, requesting information on "actions that have been or are to be taken to ensure the conservation, improvement and add value to the rich heritage these salinas treasure". Whether there was a reply to this question, it remains unknown.

The acknowledgement of the heritage of Peralta and its salinas has had a great ally in the Cultural Association *Castell de la Mora*, which contributes to stimulate cultural life of Peralta. Among other assets, it has recovered the Kings Fair since 2002, a market that once gathered the townspeople of Gabasa, Peralta, Calasanz and Cuatrocorz for the trade of all kinds of food, livestock and tools. Today the fair is a moment of gathering between former and present residents in the area. The association has organized more than twenty cultural events; the 2012 edition being devoted to the salinas. Inspired by the events of that day, the association signed an agreement with the owners of the site to carry out cleaning and minimal maintenance activities, in order to improve the accessibility to the salinas and show it to visitors. The municipality of Peralta also supports the recovery if the salinas and conversations with the owners are being held to ensure further recovery activities.

5.4.8 Arcos de las Salinas (Teruel)

General view of the salinas de Arcos, in the bottom of the valley (©Katia Hueso)

Detail of the crystallizers in Arcos (©Katia Hueso)

Detail of the brine elevation mechanism (©Katia Hueso)

Entrance to the Ermita de los Dolores, at the entrance of the salinas, with the salter's house at the background (©Katia Hueso)

Figure 5.14: Images of Arcos de las Salinas

After the privatisation in 1869, the historical salinas were sold in the mid-twentieth century to a family, which started its operation in 1953 (Albir 2008, Arroyo 1961, Cuesta 2008). In 1982 the salinas were transferred within the same family, which retains ownership until today. The new owners exploited them for a while until they were forced out of business because of their low profitability. After a while they were aware that keeping the salt production as in the past was no longer possible, so they became interested in using them for other purposes, for which the collaboration with public institutions was essential.

In 2009, the municipality of Arcos requested the regional government of Aragón to declare the Salinas de Arcos as BIC. A year later they do so, with the category of site of ethnographic interest. Around this time, the salinas start to attract the interest of scholars (Albir 2008, Cabo 2004, Cuesta 2008, Iranzo & Albir 2009, Mata 2009, *et al*. 2013). In 2011, historian Raquel Falcón prepared a proposal for the sound use of the Salinas de Arcos, as part of her training as magister in Cultural Management at the University of Zaragoza, albeit unpublished. In this work, she proposed the creation of a trust to manage the salt heritage of Arcos and the opening of a visitor reception centre, which could be located in the manor house that lies in the middle of the salinas, as well as a series of activities to disseminate this heritage. Her work also cites the importance of improving the access to the nearby ski resort of Javalambre, to

allow a flow of visitors into the Salinas de Arcos. Another historian, Cristina Albir also published some works on the salinas, which condemn the state of abandonment in which they are and warns of the need to act fast to recover them (Albir 2008, Iranzo & Albir 2009). In one of her publications, in collaboration with Emilio Iranzo, of the Department of Geography at the University of Valencia, the creation of a municipal heritage park in the salinas is proposed (Iranzo & Albir 2009). This type of instrument, without being legally binding, aims to combine heritage protection with its use as a resource for local economic development. In the proposal, they refer to the relatively good condition of the facilities, which should contribute to the preservation of the heritage assets, provided a fast action. Among the stakeholders cited by the authors, in addition to the owners, is the Cultural Association La Sabina, which offers its full cooperation and has done its share of research on the site, too (Cabo 2014).

Among the studies on the salinas, archaeological research is pending to better determine the date salt production started in the area. The company *Qualcina*, led by archaeologist Javier Ibáñez, had already started, although the lack of public funds has paralyzed its progress.

On the other hand, the owners agree with the need to protect the heritage. Despite not having been notified of the intention of protecting the site, they declare being ready to cooperate with the regional administration. Other stakeholders perceive that the owners resented this to the point of showing public hostility towards representatives of the municipality, which in turn believes the property should be fully transferred to them. In 2015, talks with the municipality and other stakeholders resumed, with the idea to unblock the situation and to recover the site. Due to the strong positions of both parties, they have also stagnated so far. In the meantime, in 2014 the property commissioned an architect to propose a project of consolidation of the chapel of *Nuestra Señora de Los Dolores*, at the entrance of their property. It is a cultural reference for the residents of Arcos, who used to pilgrim once a year to this place to worship, and it would constitute a symbolic step towards the sound and open use of salt heritage.

All stakeholders agree that the declaration of BIC has been beneficial to the Salinas de Arcos, especially because it may attract new opportunities. One possibility is to create synergies with adventure tourism or nature observation companies that already exist in Arcos. Another point of interest with which to create synergies is the Centre for Dissemination and Practice of Astronomy *Galáctica*. Built in 2015 in the nearby mountain *Pico del Buitre*, at 1,956 m above sea level, it takes advantage of the clarity of the skies. The tandem between salt heritage and dissemination of astronomy is highly innovative and may attract an audience interested in quality and original eco-cultural tourism experiences.

5.4.9 Salinas de Espartinas (Madrid)

General view of valley of salinas Espartinas, with the saline streams visible at the left (©Katia Hueso)

Side view of the main crystallizer with one of the brine sources on the left (©Katia Hueso)

Another view of the main crystallizer (©Katia Hueso)

Detail of the structure of the crystallizer (©Katia Hueso)

Figure 5.15: Images of Salinas de Espartinas

Already before the privatisation, the salinas were in very unfavourable circumstances because their production had been declining since the better days of the sixteenth century (López-Gómez & Arroyo 1983, López-Cidad 2006, Puche & Mazadiego 1999, Puche *et al*. 2000, Tostón *et al.* 2002, Tostón & López-Cidad 2008). To further complicate its operation, the construction, in 1850, of the railroad from Madrid to Aranjuez destroyed nearly three hundred evaporation ponds that were located in the bottom of the valley. However, the combined production of common salt and sodium sulphate maintained the activity ongoing during the final three decades of the nineteenth century and the first three of the twentieth century, until the Spanish Civil War. The production of salt in the summer and sodium sulphate in the winter, gave full time work to some families. This is a remarkable fact, since only in this area of the Tagus Valley were the salinas operating throughout the year. In the other inland salinas, the autumn and winter seasons were parentheses in which, at the most, some maintenance or minor repairs were done to allow operation during the summer. In the salinas of this area, such as Espartinas, one could say that there were two seasons: one for salt and one for sulphate. Due to the chemical features of both substances, their harvest could never overlap. However, even with this advantage, it was not enough to keep the sites active for a longer period of time than other inland salinas. The site faced similar problems to others: Sodium sulphate was being obtained by industrial means in nearby mines, which

closed the market for these small facilities. The Spanish Civil War also left its mark on the salinas: many of its buildings were destroyed, as they were found in a front line. After the war, production resumed for some years. In the 50s some renovation works were done, but activity finally ceased in the 60s. Ever since, the remains of the salt making activity are becoming scarce to the point of virtually disappearing.

The Spanish Society for the History of Archaeology (SEHA) has had a leading role in the research and dissemination of the heritage values of the Salinas Espartinas, with frequent archaeological excavations campaigns that have allowed to date local ceramics as Chalcolithic and to facilitate understanding of the role of salt making in Prehistory (Carvajal 2009, Carvajal *et al.* 2002, Valiente & Ramos 2009). The SEHA members have also collected abundant historical documentation concerning these and other salinas (López-Cidad 2006, Puche & Mazadiego 1999, Puche *et al*. 2000, Tostón *et al.* 2002, Tostón & López-Cidad 2008). In 2007 the Salt Documentation Centre was opened, located in the *Casa de Cultura* (cultural centre) in Ciempozuelos. After a period of closure, the centre is now open again.

Already in 2001 and 2002 the SEHA and the Cultural Association La Torre had begun work to frame the physical limits of the area around the salinas that was to become a BIC. The area was finally declared BIC in 2006, with the category of Archaeological Zone (SEHA 2009). In the same year, the SEHA organized the International Congress "The historical exploitation of salt: Research and value", in which valuable experiences were collected, intended to inspire work the recovery and sound use of the Salinas Espartinas. However, these efforts did not yield the expected results back then. Many of the members of SEHA that gave momentum to the declaration of BIC, are now dispersed in different locations and have shifted their focus of interest away from salt. However, SEHA organised in 2016 a similar conference to commemorate the 10th anniversary of the previous one. This time, the municipality of Ciempozuelos has shown interest in the recovery of the salinas and has initiated talks with SEHA and IPAISAL for this purpose. Meanwhile, access to the salinas is prevented by a fence installed by the owner of the property. The road has been ploughed and therefore is access is virtually impossible. The municipality of Ciempozuelos is taking legal measures to reopen the road.

5.5 Current situation of the study sites and similar salinas

The narratives offered above show a picture of the current business and sociocultural environment of artisanal inland salinas in Spain as well as the complexities faced by each site. These narratives reflect how far the sites got in their patrimonialization processes and the good practices that have led them in that direction. But the sites fare in very different condition and challenges loom ahead. Both, good practices and challenges, are discussed below.

5.5.1 Good practices

Among the term "good practices" are included those that have been implemented with a positive result, but also mistakes (also by omission), from which lessons can be learnt. Good (or, for that matter, bad) practices cannot constitute a recipe to solve a situation. However, they may inspire change or strengthen any given recovery process. Among the nine inland salinas studied here, a number of them coincided in some practices that were deemed successful by different stakeholders. In other cases, some practices that had not been done, but could have proven useful in hindsight, are also cited. The list of good practices has been ranked in the order that seemed most logical and efficient in the cases discussed.

Some of these (missed) opportunities for improvement were:

- *Proper identification of stakeholders*: In order to understand the implications of recovering heritage, one needs to see who perceives the site as "their" heritage. Not only its legitimate owners or managers, but many other stakeholders can be included. Modifications in a place with historical importance can even affect communities that lie well beyond the physical limits of the site. A proper identification of people and institutions involved with the site is essential to ensure a balanced dialogue in future meetings and decision making processes. A good example of this was the recovery of the salinas of San Juan, in which most if not all stakeholders were involved at a horizontal level.

- *Motivation of stakeholders*: The involvement cited above is best reached with a bottom-up approach, in which there is less suspicion of power struggles or corporate / political interests among civil society organisations and the general public. In the recovery processes of Salinas de Añana or Poza de la Sal, former salt makers feel a renewed sense of pride about their site and are most willing to collaborate in its dissemination. This sense of pride took some time to take off the ground in Añana, because the first years of the recovery process were focused on technical issues and the local community did not feel involved.

- *Strong agreements between stakeholders*: It is worth taking the time and effort to reach agreements in which all parties feel comfortable. Stakeholders will feel acknowledged and more motivated to cooperate if there is a win-win situation for all. The success of Salinas de Añana is partly reached because of a long lasting negotiation process between the provincial government (which later constituted the *Fundación Valle Salado*, current manager of the site) and the salt makers, gathered within a corporate society, *Gatzagak S.L.*. In Rambla Salada, a long lasting transfer agreement between the owners (the regional government) and an NGO are giving good results in the maintenance of the site. Similarly, in Peralta de la Sal long lasting efforts are being made by the Cultural Association *Castell de la Mora* and the

municipality, to attract the owner's interest in the recovery of the site, rather than using political pressure. On the other hand, in Arcos de las Salinas, past arguments between the owners and the municipality are hampering the renewed efforts to meet and reach an agreement.

- *Gathering knowledge about the site*: A deep knowledge of all aspects (historical, architectural, environmental, ethnographic.…) about the site will contribute to preserve the authenticity in its recovery and prevent errors in the process. Añana, Poza de la Sal, Rambla Salada, Gerri de la Sal, Imón and Espartinas are examples of well-documented sites. But it is also worth noting that an inadequate knowledge of the architect in charge of the recovery of the salinas of San Juan caused serious failure in the masonry and needed repair after a couple of years.

- *Adequate planning*: A long term, detailed planning instrument is necessary to keep the course desired. Planning also contributes to evaluate mid-term outcomes and allows to go off course when needed. Planning also allows to allocate human, technical and financial resources to the project and allows to prepare them in advance. Salinas de Añana, Poza de la Sal and Imón have received a Master Plan; other sites are included in sectorial or natural resources management plans.

5.5.2 Challenges ahead

Despite the efforts of certain sites and their successes, there are still some challenges ahead that are needed to overcome. The challenges are in fact common to most sites, despite their differences in the degree of recovery. Obviously, the sites that are lagging behind, should consider the good practices stated above also as challenges.

- *Conflicts of land use*: Given the diversity of stakeholders involved in a given site, the use they intend for it may be different, too. In some cases, poor planning or even enforcement of the law, causes open conflicts to arise. In Imón, for example, the owners are not keen on receiving visitors, but the site has no other means to inform passers-by than a no-trespassing sign. Looters and curious visitors tend to ignore it. Hunting and other outdoor sports and leisure activities can negatively affect the site's natural and cultural values. Flora, fauna, paths and streams can be destroyed, if misused. In Salinas de Añana, for example, it was the restoration works themselves that threatened to affect the endemic beetle species that lived in the stream passing right through the valley, through which machinery was being moved.

- *Maintenance beyond the inauguration phase*: It is relatively easy to justify the need of funding for rehabilitation and reconstruction of former salt making facilities. But once recovered, their maintenance costs can eat up the resources generated by the exploitation of the site and threaten the viability of the project. Funding bodies find it more difficult to justify the need of pumping resources into an ongoing project.

- *Weak institutional structure*: Given the geographical isolation and low population density of most sites, the institutional network on site can be weak. Stakeholders often overlap and their roles may even contradict themselves. In Salinas de Añana, some salt makers are also council members and may present conflicts of interest within the same person. In Poza de la Sal, on the other hand, the Association of Friends of the Salinas of Poza, in charge of the recovery works, is a relatively strong

NGO but works on a volunteer basis. Their board members are subject to large workloads and at some point, may not be capable of handling them properly.

- *Repeated visits*: Encouraging visitors to repeat their visit to the site is key to ensure a certain income and raise the profitability of the site. Añana's programme "Open for repairs" has proven to be successful. Since most visitors to these sites are local, similar approaches to enhance repeated visits should be stimulated.

- *Seasonality*: Similarly, visits tend to concentrate in the vacation periods and in the weekends. Programmes for groups (elderly, schools) as well as agreements with other local businesses may allow spreading the visits in the calendar. In Añana, programmes are offered to take brine treatments, during the week.

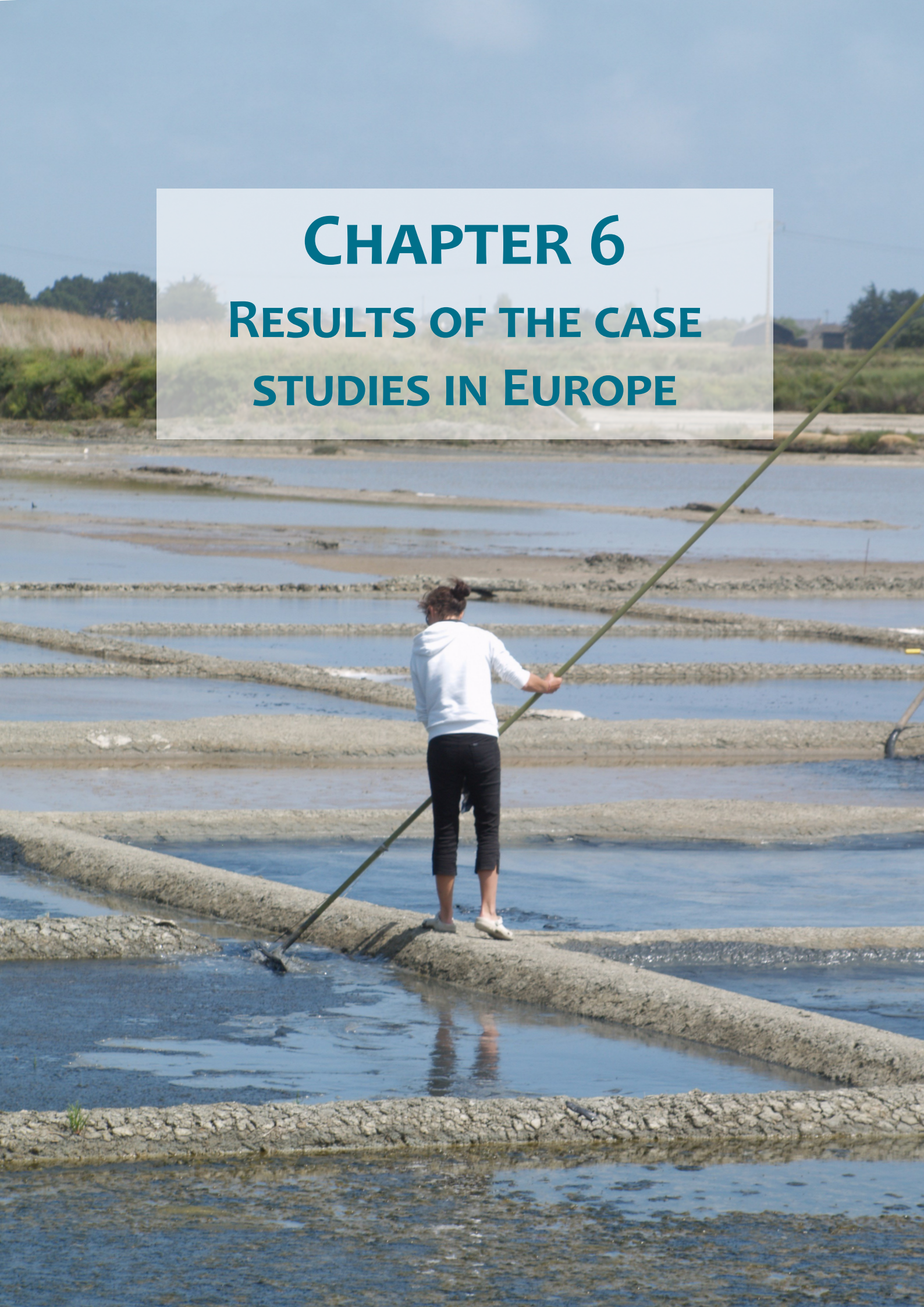
- *Low profitability in the long run / the "salt bubble":* Artisanal salt making sites strongly rely on the production of high-end culinary salts, some of which are blended with spices, herbs and aromas. However, the public tends to buy these salts only once, out of curiosity, and perhaps repeat a certain salt or salt mix of their liking. On line sales allow former visitors to keep buying the salt, without needing to re-visit the site. However, it is the question whether these salts are a passing trend or their will stay in the market for a longer time. Salt makers should be vigilant of this.

- *Growing competition from similar forms of heritage*: With over 1,000 saltscapes and salt heritage sites only in Spain and Portugal and a few hundreds of them elsewhere in Europe, it is of course unthinkable of recovering them all. But recovery of such sites does not respond to a logic beyond the serendipity of having the necessary resources and willingness at local level. Hence, competition between sites may arise, gourmet salts appear everywhere in the market and visitors tend to travel to one, at the most two of them, under the "seen one, seen all" effect. Salt making sites need to profile themselves properly and offer original products and services to attract visitors, beyond the "salina, museum & spa" trilogy (see next chapter). Arcos de las Salinas, for instance, has the potential to combine it with astronomical tourism, in a unique set of interests, as a result of a synergy between local assets and values.

5.6 Conclusions

This chapter constitutes the first true results section of the thesis. The narratives of the patrimonialization processes of the nine study sites in Spain are offered. The general overview in the first part of the chapter already shows that they share common features with respect to recent history, location and socioeconomic challenges. All of them were privatised in 1869 and, prior to that, had been historically relevant at regional or even national scale. They generally lie in isolated areas, with low population density and harsh climate. However, the results of the indicator tool, show strong differences in the characterization of the sites, as well as their heritage values and potential of sustainable use, both as tourist destinations as active salt making sites. Out of a possible range between 0 and 100, the sites have obtained scores between 22 and 90, revealing the importance of local idiosyncrasy despite their common features. While the indicators offer a picture of the current situation of each site, the narratives reconstructed from an array of sources -interviews, bibliography, field visits- provide a possible explanation of these differences. The recent history of each site varies considerably after the privatisation, and how well the patrimonialization process of a given

site is doing bears a strong relation to the ownership, management and the process itself of declaration as BIC. In more recent times, the role of public-private partnerships and the approach towards the participation of stakeholders has also influenced the outcome of each site. One of them, Salinas de Añana, stands out as the strongest patrimonialization process, with an institution devoted exclusively to the management of the site. Others with an ongoing, steady process, are Poza de la Sal, Rambla Salada, or San Juan with independent organisations in charge of the management. Imón, in spite of its relatively high score, is the only site actually moving *away* from patrimonialization, in a downward direction. The rest of the sites are in hands of private individuals or companies without the will or capacity to lead a patrimonialization process and the little efforts that exist in this direction are being taken by other stakeholders, which makes the processes themselves weak and unstable. Despite these differences, the inland salinas in Spain have similar strengths and weaknesses and face common threats and opportunities, that can be useful to understand in order to improve the chances of attaining a sustainable local development in each site. To this end, also common good practices and future challenges have been identified. Among the latter, the most relevant are the conflicts of land use in these sites, the cost of maintenance beyond the novelty phase of heritage-based activities, the weak institutional structures in charge of the sites and the need to encourage repeated visits to provide enough revenues. The risk of repeating patrimonialization experiences, such as that of Salinas de Añana, without acknowledging one's own unique features, and the ever-present threat of competition by similar forms of heritage, are other challenges that need to be taken into account.



Chapter 6
Results of the case studies in Europe

Table of Contents Chapter 6

6.1 Introduction

In this chapter, second part of the true results section of the thesis, the different study cases in Europe are presented. The text starts with a justification of the choice of the three study sites, which have undergone a satisfactory patrimonialization process and can now be considered consolidated. A joint description of the sites follows, allowing the comparison between them and with the Spanish study sites. The scores of the indicator tool are also shown, intended this time also as a comparison with the Spanish study sites. The bulk of the chapter, however, is the presentation of the three selected sites. Each one starts with a geographical description and a brief review of the salt making history in the area. The salt making technique itself is not described, but references are provided for those interested. Especially important in each case is the analysis of the patrimonialization process, starting from the moment of decline, the (re-) discovery of the salt making heritage in the area and how it has gradually been transformed into a heritage value. Attention is given to the role of the different stakeholders involved and to the current management issues. Also, the role of tourism, nature and health and wellness, as pillars of sustainable development, are discussed. The narratives of patrimonialization are fed by a combination of literature, interviews and field visits. The description of the sites ends with a list of good practices in heritage management, and the threats and challenges in the use of this heritage are discussed. If possible, pitfalls and mistakes in this process are briefly analysed, too. Each case study has a short conclusions section that summarizes the main outcomes of the analysis. The chapter then ends with a brief reflection on the role of European funded projects and the international projection of the three sites.

6.2 Why European success stories

Chapters 3 and 4 already introduced the great diversity and abundance of saltscapes and salt heritage in Europe. The growing appreciation of cultural and natural heritage and the different protection instruments existing at international, national and regional level, allow many of these sites to have been transformed from an (abandoned) productive activity into a heritage asset. No comprehensive studies have been made on the protection and status of European salt heritage as of yet, only partial references exist referring to certain geographical areas (Carrasco & Hueso 2006c, 2008a; Petanidou & Dalaka 2009, Román 2014) or sectors (Petanidou & Hueso 2011a, Sadoul 1998).

The recovery of salt heritage is a complex task. Salt making is an activity that can be considered "industrial" because of the type of facilities involved, but also "rural" because of the socioeconomic context; "agricultural", because of the know-how to be applied; "modest", because of the techniques used and "natural", because of the setting. To take all these factors into account and recover heritage by improving livelihoods without harming their fragile nature, requires care, time and resources in abundance.

In this chapter, I would like to delve into three cases (see Figure 6.1) in which the recovery of salt heritage has been achieved soundly and the site is now thriving (again), after abandonment, external threats or uncertain future, namely: The Marais Salants de Guérande, in France; the Læsø Saltworks in Denmark and the Sečovlje Soline in Slovenia. These cases can be considered success stories, with a consolidated patrimonialization process, which does not mean it has been completed, but that it is rather stable.

The most interesting feature of their experience, however, is not fact that they have attained success, but the process of patrimonialization and recovery itself. Although there are similar cases elsewhere, the three sites selected offer a complete overview of the process and the reasons for this success can be tackled.

Figure 6.1: Location of the three case studies of saltscape recovery in Europe (Source: Own elaboration)

Table 6.1 offers a summary of the key features that describe the salt making sites, according to the criteria offered in Chapter 3. As can be seen, the sites are rather similar from the points of view of the source of salt and the production technique and scale used.

Table 6.1: Description of case study sites according to criteria in Table 3.2

Site	Geophysical features			Productive features			
	Location	Landscape	Hydrogeol. origin	Production method	Energy source	Scale	State of facilities
Rest of Europe							
Guérande	Coastal salina	Marsh	Sea	Trad. solar evaporation	Sun & wind	Artisanal	Active
Sečovlje	Coastal salina	Coast	Sea	Trad. solar evaporation	Sun & wind	Artisanal	Active
Læsø	Coastal salina	Marsh	Sea	Seething	Biomass	Artisanal	Active

Source: Own elaboration

But, when looking into the patrimonialization process, the three case studies are very different from each other. Interestingly, all three of them have reached a status of successful recovery, in spite of having followed very different "roadmaps". The main features of these three processes are indicated in Table 6.2.

Table 6.2: Main features of the three study sites

Site	Score	Patrimo-nialization process	Approach	Cause of change	Owner	Manager	Main source of funding
Inland salinas (BIC)*	22-90	Institutional	Top down / on paper	Abandonment	Mostly private	Public / Private	Public
Guérande	93	Social	Bottom up	Threat of land use change	Private	Coope-rative	Largely private
Sečovlje	91	Corporate	Top down	Abandonment / Political change	Public	Large corporate	Largely private
Læsø	75	Institutional	Bottom up	Historical reconstruction	Private	SME	Private (initially public)

*Provided for comparison. More details can be found in Chapter 5
Source: Own elaboration

The patrimonialisation process in each site has been triggered by different events, that usually were a (final) consequence of the decline of the salt making activity. In Guérande, there was the threat to transform the marshes, which fared in difficult economic conditions, into a tourism development area. They are now in hands of a cooperative run by the salt makers themselves. In Sečovlje, the fall of the communist regime in former Yugoslavia left the state-owned salinas in a management vacuum. The salinas were then purchased by a large state-owned company, which now exploits them via a daughter company. In Læsø, on the other hand, salt making had been abandoned several centuries before and reconstruction of the activity was made from scratch, almost as an academic exercise. The site is now managed by a small local company. In all cases, strong investments were needed to transform their sites into a sustainable, environmental friendly and socioeconomic stable activity. Funding came from many different bodies, depending on each site. European funds have been very helpful especially in the cases of Sečovlje and, slightly less, Guérande. The reconstruction of Læsø was made possible mainly by the provision of local and national funds. More details on each of the sites can be found below.

When looking at the indicators used in the previous section, the graphs are visibly better fed than those representing the Spanish sites. Both Guérande and Sečovlje show strong intrinsic values, whereas Læsø is weaker on the protection, planning and networking indicators. As shall be seen below, this site has a well-defined, solid identity and are fearless to fly solo, without the aid of institutions and their cooperation strategy is focused on the local level. Interestingly, the three sites have similar extrinsic values: a stable business and a growing partnership with tourism. All three have a tight interdependence between the primary activity (salt making) and the tertiary sector (tourism). The accent may shift slightly, as shall be seen below, but maintaining this relation is deemed to be crucial for their success.

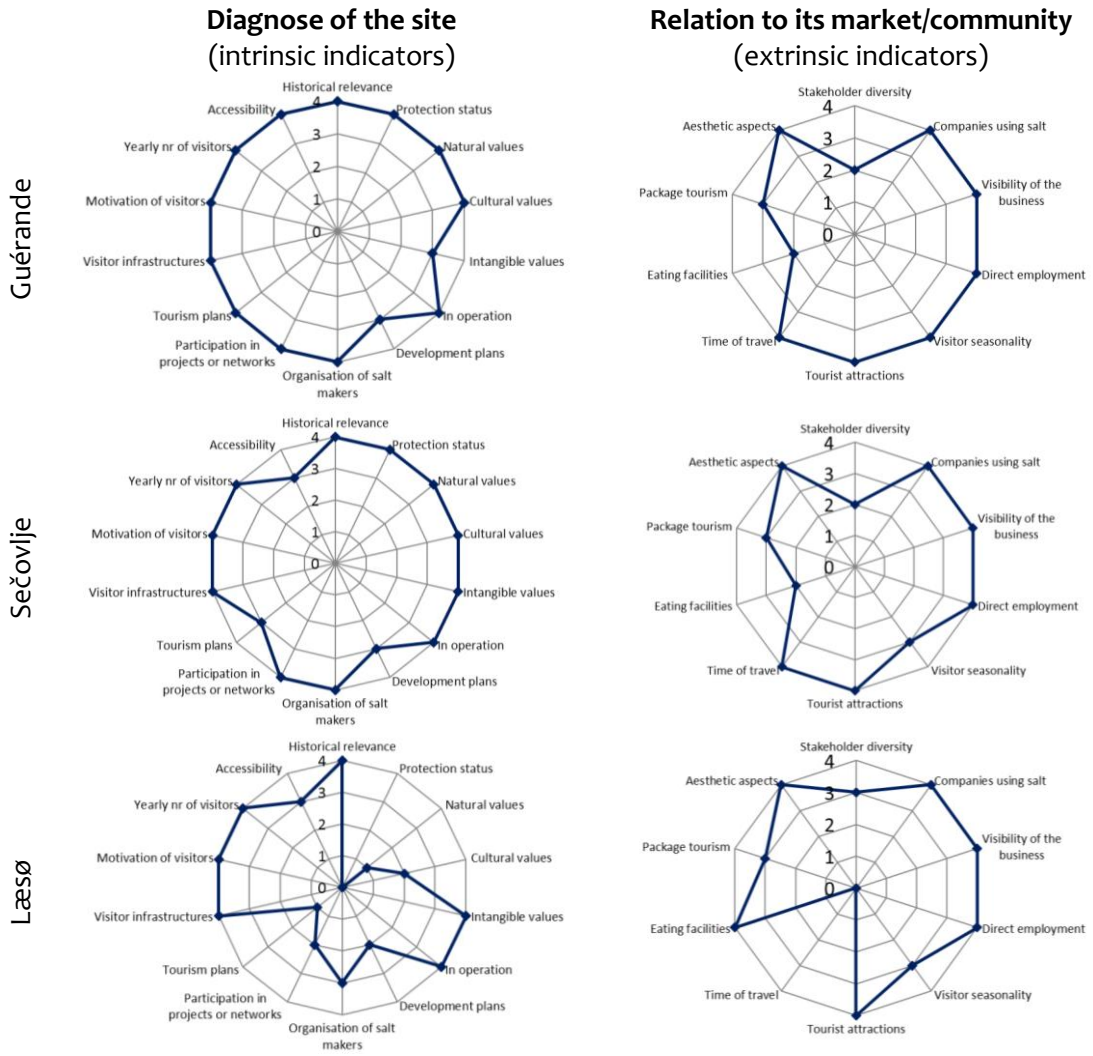


Figure 6.2: Graphic representation of the values obtained by each European site for the intrinsic (left) and extrinsic (right) indicators (Source: Own elaboration)

6.3 The patrimonialization narratives of the European study sites

In the following pages, the narratives of of the three selected study sites will be offered. The sources of information were similar to that of the Spanish sites, and therefore the same comments apply with respect to the relevance of the sources and my personal liability in the elaboration of the stories (see Chapter 5). In this case, the sites are explained in more depth, since they do not share a common history or common features, as was the case with the Spanish inland salinas.

6.3.1 The *marais salants de* Guérande (France)

Aerial view of *marais salants de Guérande*, with the different productive structures clearly visible (©Hjalmar Dahm)

Detail of the concentration basins and crystallizers (upper right corner) in Pradel (©Katia Hueso)

Paludier at work, harvesting salt (©Hjalmar Dahm)

Black-winged stilts (*Himantopus himantopus*) in an abandoned basin near Pradel (©Katia Hueso)

Maison des Paludiers, in Saillé; one of the three museums on salt in the area of Guérande (©Katia Hueso)

A group of people participating in one of the guided tours organised by *Terre de Sel* (©Katia Hueso)

Figure 6.3: Images of the *marais salants de* Guérande

Description of the area

The Guérande[78] salt marshes (47°17' N, 2°27' W, 0 m a.s.l.) are located in the southern half of Brittany (France), in the western section of the department Loire-Atlantique. They are located between the mouths of the rivers Loire and Vilaine, on the Atlantic Ocean, in the municipalities of Batz-sur-Mer, Guérande and La Turballe. They form a very large wetland zone, composed of tidal mudflats, and occupy a surface of 2,000 hectares. The coast in the region was shaped by the rise of numerous islets –such as Saillé, near Guérande–, a process that started 35,000 years ago and was ongoing until the 10th century. The strong tides and currents at the Pen-Bron peninsula, north of the salt marshes, have formed a 700-hectare estuary –here also known as *traict*–, with a soil of clay sediments, partially protected by a dune spit. This estuary is the core area of the salt marshes and is now protected by surrounding dykes (Allain 2007, Oliver & Debru 2010, Thomson 1999). These wetlands lie south of the mediaeval locality of Guérande. Two-thirds of them are devoted to the artisanal production of salt (Gras 1980).

This salt making area is part of the once abundant series of salt marshes that one dotted the French Atlantic façade, which include the yet active sites of St-Armel, Més, Noirmoutier, Île de Ré and Oléron, plus many others already abandoned or disappeared, such as Morbihan, Beauvoir, St-Gilles, Les Sables d'Olonne or Mayenne. As many as 38 salt making sites existed between the years 1000 to 1850, from St-Sulliac in the north in Bretagne; to Arcachon, to the south, in Aquitaine. These sites were located in the deepest section of a gulf, in estuaries or behind coastal barriers, such as the case of Guérande (Buron 2000, Jourdaa 1999, Lemonnier 1980, Ménanteau & Nedelec 2007). The salt marshes, whether active or not, present a complex structure, with channels, basins and dykes following the natural microtopography of the terrain, while responding to the needs of the productive process. The seawater is let into the marshes at spring tides, from where it flows into man-made ponds of different shapes, depths and sizes, until it reaches the crystallizers, where the salt is finally harvested (Gras 1980). Given the artisanal scale of the salt making activity that has prevailed in these areas, the shape of the wetlands has remained relatively natural. Each of these structures has a specific function and name, which may vary locally (Clément 1991).

The climate in the French Atlantic, between Bretagne and Aquitaine, is characterised by mild winters and cool summers, typical from a temperate coastal location, but has strong constant winds, long sunshine hours and relatively low precipitation. These features favour the production of salt, which is further enhanced by the clay soils that abound in the area, as well as the indented coast, which accelerates the concentration of the brine in the more sheltered areas (Buron 2000, Gras 1980, Papy 1931). The typical grey clay of the region not only ensures the impermeability of the soil, avoiding the waste of brine, but also accelerates evaporation, thanks to the dark hue and its heat-accumulating capacity (Buron 2000).

Brief history of salt production in Guérande

Salt has been harvested on the Guérande peninsula since the Iron Age. The first salt works to use the storage capacity of the estuary goes back to the 3rd century AD, shortly after the Roman conquest, and salt was probably obtained by *briquetage* (Buron 1990, Ménanteau & Nedelec 2007). The first salt marshes as are known today were shaped by the monks from Landévennec Abbey, who, in 945, carved them out by studying the tides, wind and sun. This

[78] The French toponym Guérande comes originally from Breton: *gwenn-rann*, the "white country" (Buron & Le Duc 1996, Oliver & Debru 2010).

was described in the first written document on the salinas, which registered the donation of the site to religious orders. The development of the salt making activity was most probably left in the hands of native Bretons, given the local toponymy. The salinas brought prosperity to Guérande for many centuries, reaching a peak in the 14th century. After the loss of the trading monopoly of the Hanseatic League, the ports of Holland and Zeeland benefitted from the salt trade and the first trading routes in Europe were opened. The prosperity of the salt making activity in Guérande was strengthened by the exemption of the *gabelle* (salt tax) that the salt from Brittany enjoyed. Today, at least five salt works from the Carolingian period are still in operation (Buron 1999, Devals 2004, Dominik *et al.* 2012, Hocquet 1986, Papy 1931, Thomson 1999).

During the 17th and 18th centuries, the trade of salt in the region was intense, exporting the so called *sel de la Baie*[79] all over Europe (Buron 1999, 2006). Although the trade of salt abroad decreased during the late 18th century, making the Atlantic salinas more vulnerable to abandonment, Guérande was still doing relatively well, because it had a strong market in its hinterland. The 19th century witnessed the greatest expansion of the salinas: In 1840, 2,353 salt makers operated in the area, a figure that dropped to 370 in 1934. The abolition of the *gabelle* elsewhere in France and changes in salt taxation negatively affected the salt trade in Guérande. The development of the oyster farming in the area tempted many salt makers, who shifted activity and used the marshes for this new purpose. This fall was most probably aggravated by the combined effect of more efficient transportation of goods by railway, the generalised use of refrigerators and the quality standards imposed by the growing chemical industry, which favoured salt obtained by industrial methods (Gallicé & Buron 2010, Lemonnier 1977a, Papy 1931, Poisbeau-Hémery 1980, Thomson 1999).

At this time, regional salt monopolies still regulated trade areas within France, allowing the sale of the salt from Guérande in several coastal provinces, which ensured revenues at regional level. However, the Treaty of Rome in 1957 abolished protected trade regions and free competition from industrial salinas from the south selling cheaper salt caused a decline of the production in Guérande. In addition, refined products (salt, sugar…) were at the time considered the highest standard of hygiene, technique and quality. Customers shifted from their local, dark and wet salt to the white fine salt from the south. It was cheaper and looked better, in their eyes. The cooperatives of salt makers from different Atlantic salt marshes (from the regions of Vendée, Charente-Maritime, Loire-Atlantique), which were in operation since 1945, tried in vain to create a federation of salt producers, which should have defended their interests. Only the *paludiers* (salt makers) from Guérande managed to keep an organised activity against the invasion of salts from other regions or even abroad, although the cooperative itself was dissolved in 1960. In 1972 the *Groupement des Producteurs du Sel de Guérande* was created, with 212 members, which will have a relevant role in the protection of the site, as shall be seen (Buron 1999, Lemonnier 1977a, 1977b; Olivaux 2006, Poisbeau-Hémery 1980).

During these years, the tourism industry underwent a rapid growth and urbanisation of coastal areas for leisure purposes was the norm. The regional and central government elaborated an ambitious plan to develop the area, including large-scale marinas and the improvement of the roads to facilitate rapid access to the coast. Although strong opposition was found and these plans were eventually dismissed, places like Pornichet, La Baule and Le Pouliguen became famous resorts and nearby towns such as Batz-sur-Mer, Le Croisic and Piriac did not escape this trend. Around that time, the *écolo-hippies* of the area protested against the massive use of pesticides to kill the mosquitoes of the area, and they quickly

[79] It refers to the Bay of Bourgneuf, including the salinas between Guérande and Noirmoutier.

joined other pressure groups in this larger issue. Thus, between 1950 and 1970, the salt marshes of the region went through great difficulties and the salt making activity was almost halted. In 1973, only 248 salt makers remained in the area (Buron 2000, Chambre d'Agriculture Loire-Atlantique 2011, Lemonnier 1977b, Perraud 2002, 2005).

The patrimonialisation of the site

In the early 70s, as said, the urban development plans encountered strong opposition from different social groups (salt makers, breton nationalists, environmentalists, academics… and even residents) belonging to at least 17 different associations. The opposition was not only political, but went out to the streets. Salt cargoes from abroad were toppled and public demonstrations were common. The remaining salt makers in the area started to get organised, with the creation of the above cited *Groupement des Producteurs du Sel de Guérande,* a professional association, which later became the cooperative which now runs two thirds of the salinas. This period has been named the "awakening" of the inhabitants of the peninsula of Guérande (Corlay 2006, Gallicé & Buron 2010, Lancien 2010, Lemonnier 1977, Olivaux 2006, Perraud 2002, 2005).

The decade of 1975 to 1985 was characterised by the reconstruction of the salt making activity and the recovery of the marshes. The main challenge was to find replacement for the ageing salt makers, as few young people wanted to take this profession. Thanks to the immigration of interested young apprentices from other regions, the activity gradually regained momentum. Because of this interest, in 1979 a training centre for young salt makers was opened, so that the technological transfer could be made in a structured manner[80]. Before that, new *paludiers* had to rely on the goodwill of experienced professionals, since the know-how was transmitted orally within the family. From 1995 onwards, a certified training programme exists in the area, in coordination with regional employment authorities and the cooperative (Chambre d'Agriculture Loire-Atlantique 2011, Thompson 1999). The training is based on three axes: the explicit, rather than intuitive transmission of knowledge; the couple "supervisor-student" and the acceptance of new *paludiers* from other regions or backgrounds[81]. Those who graduate from the course, obtain a certificate and financial aid to get installed. The availability of salt marshes for exploitation is confirmed before acceptance to the course, so that a workplace can be guaranteed to each student, and 95% of them finally can settle in the area. Those students wishing to work elsewhere, are offered a personalised training programme that covers the peculiarities of his/her destination.

In the next decade, the salt making activity gained economic strength: in 1988, the *Groupement des Producteurs du Sel de Guérande* obtained the status of cooperative and in 1989, another association, *APROSELA*, was created to encourage the production of high quality salt in Guérande. The latter is formed by local authorities, professional salt makers and other users of the territory and its goal is to "join all partners concerned by the conservation and development of the geographical and economic aspect of the salt marshes

[80] This technological transfer is still ongoing, not only at local level but also between the cooperative in Guérande and many salt making sites in francophone Africa, among other locations. The local NGO *Univers-Sel* provides since 1980 technical assistance to salt making sites in decline in this region. However, in their words, they prefer the term "exchange" (Olivier Péréon, Univers-Sel, pers. comm.).
[81] In a thought-provoking intervention, anthropologist Geneviève Delbos states that the new generation of *paludiers*, today trained formally for their work, are reinventing the craftsmanship of salt making. They are adapting the traditional know-how into a postmodern artisanal mode of salt making, according to today's needs and fashion (G. Delbos, in FMA (2007), p 45).

of Guérande" (Olivaux 2006). In the past decades, the *sel gris* had been considered a second rank product, as it was not as uniform, pure and white as was required by the market. The salt makers of Guérande managed to change the quality paradigm and enhance the value of an irregular, grey, wet, mineral-rich hand-harvested salt, which is now considered top rank[82]. Thanks to their efforts, the salt from Guérande obtained the prestigious *Label Rouge* food quality certificate in 1991. In addition, it was certified by ISO 9002[83] in 2000 (Olivaux 2006, Thomson 1999).

A key issue in the empowering of salt makers was the strong union formed by the different stakeholders that fought the development plans in the early seventies. This formed the seed of a strong social and political awareness in the area, that has now grown to become a solid, well organised supporting tissue in the region (Hueso 2015b). Much later, as a result of the Interreg IIIB SEL project, the *Fédération des Coopératives de Producteurs de Sel de l'Atlantique* was created, to collectively represent the local cooperatives of salt makers from Guérande, Noirmoutioier and Ré, thereby gaining notoriety and strength (Gouin & Perraud 2011).

Aside from the Cooperative, other salt selling companies –collectively known as *négotiants*– exist in Guérande, among which *Tradysel*, *Les Artisans du Sel* or *Natursel*, which are selling salt made by independent salt makers, one third of the total number of salt makers in Guérande. They are represented by different entities (associations, unions), which defend their interests as a group. Other independent salt makers, ca. 20 of them, have their own direct sales channels on site, in local markets, at events, in restaurants, on line, etc. These independent salt makers are usually in competitive disadvantage with respect to the cooperative, because they must take care not only of the production process, but also the whole sales chain and all the red tape associated to it[84] (Chambre d'Agriculture Loire-Atlantique 2011, Delbos 2006).

After 1995, the surface of marshes in use for the production of salt increased steadily, as the number of young salt makers grew. Of the 1176 hectares of salt marshes, 765 ha are in production; 247 ha are inactive but can still be recovered and 165 cannot be recovered any longer (Ménanteau & Nedelec 2007). According to the Natura 2000 management plan, between 100 and 300 *œillets*[85] are being recovered for salt making each year (Allain 2007, Le Petit 2007). Simultaneously, the public interest in hand-harvested (as opposed to industrial) salt was gaining strength and so did the tourism pressure in the area. Salt makers were not very happy at first, as they still saw tourism as the main threat to their livelihood –the seventies were too near, in their memory–, but slowly started to see visitors as partners rather than enemies, in their quest to defend their profession and their landscape. The relationship between salt makers and visitors gradually improved over time and the creation of the visitor centre *Terre de Sel* (see below) further contributed to regulate and ease off the previous tensions between them (Perraud 2005).

[82] Besides cultural and natural conservation arguments, the *sel gris* seems to contain healthy trace elements, both in the salt itself as from the clay its crystallizes upon and which provided this distinct colour. The humidity of the salt enhances its organoleptic features, as its blends better with the food.
[83] A certification belonging to the ISO 9000 family, now obsolete and replaced by ISO 9001. It deals with the fundamentals of quality management systems, regardless of the product of service concerned.
[84] Yet another group of salt makers exists, nl. those who are not linked to any institution, nor have the certification: they are seasonal workers who help other salt makers. These are nicknamed *hirondelles* (swallows)
[85] *Œillets* are the crystallizers in which salt is harvested. They are small enough so that the salt can be harvested from the side with a 5-metre long tool, named *las*. Each salt making unit can have 10-20 of them and an individual salt maker usually takes care of one or two salt making units.

Artisanal salt from Guérande

Today, the number of salt makers approaches 300, of which two-thirds belong to the cooperative and the rest are independent. Most of them work full time at the salinas and salt making is their main, if not sole, source of revenue. Three quarters are young and coming from other regions of France, thereby ensuring the replacement of workers on the long run (Grégory Pitart, *Cooperative de Producteurs de Sel de Guérande*, pers. comm.). In addition, the salt making activity generates 115 to 120 permanent jobs and ca. 300 seasonal jobs, whether at the cooperative, or in trade, as intermediaries or at direct sales points. The salinas as a whole produce around 16,000 tonnes of coarse salt (*sel gris*) each year and another 700 tonnes of fleur de sel, having obtained a revenue of 20 million Euro in 2015 (Chambre d'Agriculture Loire-Atlantique 2011; G. Pitart, pers. comm).

The salt produced in Guérande is used mainly in the food sector: 75% as culinary salt[86] and 20% in the processing of other food items. Only 5% is used for non-food purposes, such as agriculture or de-icing. It is exported to more than 50 countries and has been recognised with the EU Protected Geographical Indication (PGI) (Dahm 2005, Gouin & Perraud 2011). The salinas have also been acknowledged as a *Site Remarquable du Goût* (Remarkable Gastronomic Site). The associated businesses of salt by-products such as gourmet foods or cosmetics are growing. Also, visitors are well spread throughout the year and can enjoy a large variety of nature- or culture-based experiences in the area.

The salt making process has been abundantly described in both vernacular and academic literature, with a fair number of ethnographers and other specialists who have studied this productive activity in depth, both from the point of view of techniques as the hydraulic management (Anras *et al*. 2004, Anras & Chastaing 2005, Buron 1999, Clément 1987, Delbos 1983, 2007a, 2007b; Delbos & Jorion 1984, Hocquet 1986, Jourdaa 1999, Lemonnier 1980, 1984, Ménanteau & Nedelec 2007, Thomson 1999). Both *paludiers* as residents are proud of their salt making, and especially stress the fact that it is being done by hand. Inspired by this, the strategy of salt making in Guérande is based on three axes: the site, the people and the product. The site is the basis of the *terroir*, which means the geophysical features of the territory, the climate and the history of the region. People or, in this case, the *paludiers*, are the intermediaries between the product and the site. Thanks to their professional know-how and their sense of pride and belonging, the salt from Guérande can be produced as it has always been done. Given the artisanal method of salt making and the specific features of the site, the salt from Guérande is unique as a product. It has its own organoleptic profile and provides a unique taste experience when used as a condiment (Dahm 2005, Olivaux 2006, Perraud 2002).

The salt sales strategy in Guérande has evolved according to this view. In the decades 1960 to 1980 the strategy was common to all salt making sites, providing very few and uniform types of salt to the market (coarse, fine…), which gave a strong competitive disadvantage to artisanal salts vs. industrial ones. Between 1980 and 1995, a shift in the marketing paradigm slowly took place, with two clear segments: high-end salts, with a strong link to *terroir*, that is to location, its culture and landscape; and low-end salts, to be used for basic needs, regardless of origin or production method. This model has evolved into a more complex diversification of products, with numerous microsegments catered both by artisanal and industrial salinas, and different levels of quality and end market (e.g. national vs international brands).

[86] A term that refers both to the salt used in the kitchen (cooking salt) or on the plate, once it is served (finishing salt).

While customers are now aware of these differences, their relevance as to landscape conservation or the preservation of a know-how must be stressed (Gouin & Perraud 2007). In the case of Guérande, the added value of the salt, that is, the surplus that should be paid with respect to industrial salt[87], lies in this triad. But also in its relation to the territory, that is, the cultural heritage, the landscape (Le Floch & Candau 2001). Customers buying salt from Guérande are also purchasing these. They take home a sense of belonging, a remembrance of past visits or the wish for future ones (Perraud 2002). Of course, authors akin to the industry have a less poetic view: "It says something about French marketing skills, and perhaps the gullibility of middle class gourmands with too much money and time on their hands, that each year the gourmet industry successfully markets dirt polluted salt for top prices" (Warren 2006).

Tourism in the saltworks

The area of La Baule – Presqu'ile de Guérande has a well-developed tourism industry. Guérande receives 1.2 million visitors per year. It is calculated that one fifth of the revenues generated in the area are related to tourism and more than 8,100 people are employed in this sector (CAP Atlantique 2013, Chambre d'Agriculture Loire-Atlantique 2011). Tourism-related companies also profit from the salt marshes, in collaboration with the cooperative and the museums: they offer guided visits, sell souvenirs (postcards, booklets, etc.), provide walking or cycling itineraries, organise cultural events related to salt, promote craftsmanship, etc. The tourism offices in the area are the first contact point of the public with the salt making tradition, and try to inform and guide them into a responsible use of the landscape (Le Drogo 2006).

Three museums exist around the world of salt making in the neighbouring locations of Batz-sur-mer (*Musée des Marais Salants*), Guérande (*Terre de Sel*) and Saillé (*Maison des Paludiers*), together receiving more than 130,000 visitors[88]. Being geographically so close –less than 10 km between any of the three– some years ago, the museums felt some competition among them. Today there seems to be a clear identity for each one, as they stress different aspects of the salinas. The *Musée des Marais Salants* is oriented towards the historical background of salt making, with a strong ethnographic character and a museographic discourse oriented towards the influence of salt making in the history and economy of the area. Of the three salt museums cited, it is the only one with a true scientific character, with a research programme and a historical collection of its own. Since 2003, the museum is owned by the *Communauté d'Agglomération de la Presqu'île de Guérande-Atlantique* (in short, *CAP Atlantique*), a consortium of public authorities that gathers fifteen municipalities between the Loire and Villaine rivers. The museum is located in Batz-sur-Mer, one of the nine historical salt making towns in Guérande. Its origin lies in the *Musée des Anciens Costumes de la Commune de Batz*, a centre that opened in 1887 as a response to the curiosity of the many tourists that already then visited the region. This was one of the initiatives of Mme Adèle Pichon, who was deeply engaged in the defence of the salt making profession and wanted to protect not only its heritage but also to preserve it for the future. This centre closed in 1970 and was reopened in 1984 as the *Musée des Marais Salants*. It went under thorough renovation of its exhibits and collections in 2012 (Buron 2005, Jourdaa 1999, Ménanteau 2012, Olivaux 2006).

[87] In 2002, 1 kg of industrial salt would sell at 0,20 Euro, whereas 1 kg of *sel gris*, at 1 euro. The added value is therefore 5 times as much as the market value (Perraud 2002).

[88] In the old town of Guérande there is a shop nicknamed *Le 'ti musée de sel*, which features a small collection of salts from around the world. Obviously, it cannot be considered a museum, not even in *sensu lato*.

The *Maison des Paludiers,* located in Saillé, was created in 1971 by the cooperative of salt makers. Smaller than the previous one, it has a more informal character, with fewer and less sophisticated objects on display. Its exhibit is focused on the understanding of the salt making process, from the chemistry of salt to the intimate and complex relationship between the *paludier* and nature. Its strongest offer are the guided visits to the salt marshes, led by (former) salt makers. The museum has a small shop with an excellent bibliographic offer.

The latest museum to be created was the *Maison du sel*, later renamed as *Terre de sel*. It opened in 1991 and was transformed into its current format in 2002. It is owned and managed by the *Cooperative Sel de Guérande* and focuses on showing the work of the cooperative. Its exhibit is rather simple, with contemporary artifacts, explaining the salt making process. Most striking is the shop, bigger that the museum itself, in which all types of salt-related objects can be found, from salt itself, to processed food, gourmet food items, salt cellars, books, postcards, toys and other souvenirs. However, the main objective is to function as an information centre for visitors, offering different types of tours with professional guides, with varying degrees of duration and themes (production, gastronomy, ornithology…). In this way, spontaneous visits to working salt marshes are avoided, and salt makers can concentrate on their work. However, some independent salt makers (i.e. not belonging to the cooperative) offer their own guided visits (Le Drogo 2006).

In addition to the facilities open to the public, there is a research station managed by the *Société des Sciences Naturelles de l'Ouest de la France*, *SNOFF* (Western France Natural Science Society), which is located at the Grande Paroisse salt pan in Guérande. It does not function as a museum or visitor centre, but rather as a scientific field station (Alliot 1999).

Wellness, health and food

The role of the salt from Guérande in raising awareness of the role of salt in gastronomy has been crucial. The *sel gris* was perhaps the first gourmet salt appearing in the international culinary market, followed later by other, well-established salts such as Maldon or Himalaya, the three being perhaps the best-known salts among the public. Many other exist now in specialised circuits (see Chapter 7), but do not have such a widespread distribution. The salt from Guérande has been inspiration for other salt making sites and their experience has contributed to help other saltscapes to come alive thanks to the growing popularity of quality, hand-harvested salts (Beltran 2008a, Petanidou 2000).

From the point of view of health, many scholars claim that unrefined salt such as the *sel gris* from Guérande is healthier, because it contains several micronutrients usually absent in refined salts, as they have been washed away in the process. These micronutrients seem to be essential for certain bodily functions (e.g. magnesium, potassium, zinc, iron…) and are naturally found in seawater (Drake & Drake 2010, Hueso 2011). But *being* in the salt marshes is deemed healthy as well. The Guérande peninsula, due to its location and climate as well as the presence of ions resulting from salt spray (both natural as induced by the salt making activity), is considered a therapeutic microclimate (Leroy 1980). However, few initiatives have been taken to take advantage of salt making, via its by-products, to be used for health purposes. In the shops, a few bath salts and salt-based cosmetics can be found, but have earned considerably less marketing efforts than culinary salts[89]. Spas and wellness centres

[89] The Cooperative intends to strengthen this aspect in the future (Emmanuel Blanc, *Terre de Sel*, pers. comm.)

associated to salt, mud or mother lay, have not been opened yet, although visitors take also "therapeutic" advantage of the seaside location of the marshes. Of course, hotels with spa and wellness services, as well as specialised centres do exist in the area, but none of them relate their business to salt making.

The nature and culture background

The Guérande salt marshes present abundant and diverse flora and fauna. The highly diverse aquatic environments with differing salinity levels justify the presence of many algae and invertebrate species, which in turn is the reason for the variety and wealth of bird species present (Chadenas 2005). In the salinas themselves, the shallow water allows the light to reach to bottom of the ponds, warm the clay and favour the development of plankton, which is the vital foundation of the food chain in the marshes. This large supply of food, combined with a mild climate, makes the Guérande salt marshes a favourite wintering and breeding site for birds and over 280 species of migrating birds pass through every year[90]. It is also an important feeding ground and stopover site for migratory and wintering species, particularly important for waders, gulls, terns, ducks and geese (Février 2009, Geslin *et al*. 2002, Poisbeau-Hémery 1980, Potard 2009).

The salt marshes also have an exceptional assemblage of flora, thanks to the many transitions present, from saline to freshwater habitats, from water to dry land. Given the presence of salt, the site is also rich in halophytes, such as shrubby sea-blite (*Suaeda vera*) or glasswort (*Salicornia europaea*). The latter is much appreciated by gourmets, thanks to its many uses and applications in the kitchen (Février 2009, Poisbeau-Hémery 1980, see also Chapter 7). In the abandoned salinas, other plants are growing, with herbaceous species such as *Phragmites sp*. and *Carex sp*. which contribute to avoid the erosion or dykes and similar structures.

The salt marshes on the Guérande peninsula were awarded the *Label Paysage* in 1992, have been listed as a *Zone Naturelle d'Intérêt Écologique, Floristique and Faunistique (ZNIEFF)* (Site of Special Interest) by the French Government since 1991 and as a *Zone Importante pour la Conservation des Oiseaux (ZICO)* (Bird Protection Area) under the 1979 European Birds Directive, thus being part of the Natura 2000 network[91]. Since 1995, the salt marshes have been protected as wetlands of international importance under the Ramsar convention. The Ramsar site also includes the *marais de Mès*, a lesser salt making area north of Guérande, which is left slightly aside from the tourism pressure found in the Guérande area, but shares many of its cultural and natural features (Alliot 1999). These marshes occupy an area of 350 hectares and are exploited by 40 *paludiers* (as compared with the 1,650 hectares of Guérande and their ca. 300 *paludiers*) (Allain 2007, Chambre d'Agriculture Loire-Atlantique 2011). Due to the development of harbours and tourism infrastructure, this area has gained further relevance for the conservation of biodiversity. Aside from strictly nature conservation instruments, the site is also a candidate to Biosphere Reserve and is included in the tentative list for World Heritage, both by UNESCO.

[90] Typical nesting birds are the little egret (*Egretta garzetta*), oystercatcher (*Haematopus ostralegus*), blackwinged stilt (*Himantopus himantopus*), avocet (*Recurvirostra avosetta*), Kentish plover (*Charadrius alexandrinus*), common tern (*Sterna hirundo*), bluethroat (*Luscinia svecica*), among others. The latter is an endemic species and has been particularly well adapted to the salinas (Dominik *et al.* 2012).

[91] To give an idea of the complexity of the site, over 70 institutions have participated in the elaboration of the Natura 2000 management plan for this area.

Current situation of the site: good practices and challenges ahead

Good practices

If one single aspect of the patrimonialisation process in Guérande should be highlighted, that is the cooperation between stakeholders at the most delicate moment in their history, namely, during the almost irreversible abandonment of the salt making activity in the 1970s. The capacity to get organised in cooperatives and other professional associations has contributed to join forces around the landscape and the creation of a certified training scheme has been crucial for the intergenerational transfer of knowledge. Finally, the elaboration of a strategy around salt, based not only on the product but also on the people and the landscape, has provided a strong framework of reference for the *paludiers*, residents and customers. Their message has come across, loud and clear, and has become a worldwide reference for all other artisanal salt makers.

Challenges

The protection of their salt as a quality brand is an issue of concern. The denomination *fleur de sel* was first used in Guérande. However, given the commercial success of this type of salt in the past decades, some industrial producers of southern France have started to use it, too, and so have many other salt making companies elsewhere, both in France as abroad. Despite having requested the legal exclusivity for the use of the term, the local *paludiers* did not obtain it and has now become a generic name for this type of salt. The cooperative is now fighting to establish standards for the production of *fleur de sel*, which should be complied with by anyone selling this type of salt, similar to those published by *Nature et Progrès*, a certifying organisation for organic food. In the meantime, theirs is sold as *fleur de sel de Guérande*, to ensure customers are aware of what they are purchasing (Grégory Pitart, pers. comm.). Another challenge is to obtain the European certification as an organic product. Although it has already been requested, EU authorities have rejected it, on the grounds that salt is a mineral and cannot be "grown" with organic criteria. To this end, the cooperative has engaged in several EU-funded multi-partner projects, which are slowly achieving recognition of the artisanal and agricultural character of the activity. As a result of these efforts, in France and Portugal, hand-harvested salt has obtained the legal consideration of an agricultural, rather than mining, product.

On the other hand, the *sel gris* is now readily available throughout the world, thanks to the growth in productive surface and its global popularity. Hence, this salt risks to offer an image of "industrialised" salt, as some kind of boomerang effect that should be avoided (Perraud 2002, 2005). Also, independent salt makers fear losing direct contact with their customers if they decide to join the cooperative. They also criticize the contradictory message of a sustainable, low-carbon salt making activity while exporting it to over 50 countries worldwide, with the high carbon transport costs this implies (Weiler 2016).

The settlement of new professional salt workers is still difficult, given the lack of free marshes for them to work on. Although there are still marshes left fallow, these are intended for the conservation of nature. If the cooperative wishes to put them in service again, tensions may arise with nature conservation authorities and environmentalists. As a consequence, there is even a certain danger of speculation with the trade of salt making land. Another difficulty for new salt makers is to find housing, as the tourism pressure on the region has increased the average rental fees, well above standard (Perraud 2002, 2005). Also in relation to workers, another challenge is the governance of the site. The two main entities driving the

management of the salt making activity, the cooperative and the independent salt makers, need to agree on their views for the future. The recent history of salt making in Guérande has seen conflicts between these groups and finding a common understanding is essential for the future of the site (Chambre d'Agriculture Loire-Atlantique 2011, Steyaert *et al.* 2007).

One of the biggest challenges faced by the salt makers of Guérande, was the oil spill of the *Erika* tanker, in 1999. After arduous discussions, the cooperative decided to halt their activity during two years, not allowing the flow of seawater into the marshes, to ensure the salt to be harvested later was clean. This was a serious threat to the local economy during that time, but proved to have been the best decision. Of course, the threat of pollution coming from the sea will always be there. An additional threat is the sea-level rise that is slowly occurring because of climate change. Events such as the *Xynthia* storm suffered in 2010, with high winds, floods and a death toll of 47 persons in France, show the vulnerability of the area. Measures such as dyke reinforcement and constant monitoring should contribute to prevent future material and human losses (Chadenas *et al*. 2014, Jourdaa 2016, Lancien 2010). Related to the rising level of the sea is the problem caused by the impermeabilization of the soil in the neighbouring towns. Wetlands have an important role in flood control, but the reduction in wetland surface and urbanisation of adjoining land, may worsen the effects of floods, even more so if the risk increases due to climate change (Gildas Buron, *Musée des Marais Salants*, pers. comm.).

Finally, another external challenge is the management of the flow of visitors. The easy access to the marshes and a lack of knowledge of the salt making process used to produce certain tensions between visitors and salt makers, as the former invaded working areas or even took a handful of salt from the piles on the roadside. Visitors are now encouraged to follow formal guided tours form one of the museums and are thus instructed to understand and respect the work of salt makers. However, some voices claim it should be the salt makers themselves explaining the values of the site, as they have the best possible knowledge and experience. This issue is still under debate (Le Drogo 2006).

Conclusions

Despite these challenges, Guérande is considered to epithomise the sustainable local development around artisanal salt making. It has become a paradigm of reference for most artisanal salt making areas in the world. From a dire situation of decline, which reached its deepest point in the 1970s, the salt harvested in Guérande has now worldwide fame as a top-quality product which is even imitated by industrial companies and many foreign salt making sites. The key to the success has been the strong social fabric built around the activity, with a well-balanced coordination between stakeholders. No doubt this has been aided by the traditional French pride in their home produce: the *terroir*. In addition, the creation of an all-encompassing organisation devoted to the protection of the product, with many lessons learnt on the way, plus the combination of sustainable uses of the land (eco-cultural tourism, gastronomy, health), has provided a diversified economy to the region that is not only going strong but ambitions to grow. Within the limits of sustainability, so far.

6.3.2 The salinas of Sečovlje (Slovenia)

Aerial view of the old salinas in the Fontanigge section, in Sečovlje (©Hjalmar Dahm)

General view of the salinas in the Lera secftion, still active (©Katia Hueso)

Salt worker collecting salt at Lera (©Katia Hueso)

Museum of Salt-Making and the Grande-Drnica canal, in the Fontanigge section (©Katia Hueso)

Open-air spa Lepa Vida, located in the middle of the salinas of Sečovlje (©Lepa Vida)

The Montfort storage building in Portorož (©Katia Hueso)

Figure 6.4: Images of the salinas of Sečovlje

Description of the area

The Sečovlje[92] salt pans (45°29' N, 13°36'E, 0 m a.s.l.) are located in the upper Adriatic, on the southernmost tip of the 46 km stretch of coast in Slovenian Istria, at the border with the Republic of Croatia. They are the northernmost active salinas in the Mediterranean and one of the few in the region that use artisanal methods. The salinas are located in the municipality of Piran and are named after one of its settlements. The Gulf of Trieste and the Istria peninsula were historically rich in salinas, including, from north to south, Muggia and Aquillina near Trieste; Semedela and Polje in Koper; Sečovlje, Fazan and Strunjan, in Piran; Izola, Poreč and the Brioni islands (Beltram 2006, Geister 2004, Hocquet 1982). The salinas of Sečovlje were the biggest of them, with over 2,000 crystallization basins in the 16th century and over 4,000 in 1801, more than double to ten-fold what the other sites had. They consist of two parts: Its northern section, where salt is still being actively produced, is known as Lera.

The southern section, Fontanigge, also known as "the mediaeval salinas", is separated from Lera by the Grande–Drnica channel. These salinas are inactive and used occasionally for demonstration purposes. The southern edge of Fontanigge is formed by the Drangonja river, the current border with Croatia. A few kilometres to the north, there is another active site, Strunjan, belonging to the same salt making company. The area hosted other salinas, such as Fazan in Lucija, halfway the latter two, which were abandoned over a century ago, as happened with others elsewhere in the region (Koper, Muggia…). The Sečovlje salinas owe their location to the local geomorphology (i.e. the clay deposits of the Dragonja river, Geister 2004) and the shape of *cul-de-sac* the Gulf of Piran has, where the sun and heat concentrate best.

Perhaps the most relevant factor in the history of salt making in the area is the geographic position of the salinas, dotting the northern edge of the Adriatic, in a region of high geopolitical turbulence. The identitarian ties of Slovenian Istria to its surrounding countries are very strong. Piran belonged to the Republic of Venice between the 13th and the 18th centuries, the Austro-Hungarian Empire from 1797 until the start of World War I and there was a short period of cession to the Napoleonic Empire between 1806 and 1814. In the past one hundred years, this region has been part of the Austro-Hungarian Empire (1812-1914), became part of Italy in the interwar period (1914-1940) and was annexed to Yugoslavia in 1954 (Kinder & Hilgemann 1985).

Since 1991, the area is part of Slovenia[93] (Geister 2004). As a consequence, the population has shifted from mainly ethnic Italians to mainly ethnic Slovenes, depending on the exact location and the period of survey. Today, the municipality of Piran is officially bilingual (Slovene / Italian) and many inhabitants are fluent in other languages (Serbo-Croatian, English…). The exact location of the border with Croatia still is under debate among certain interest groups. The maximalist hypothesis establishes that Croatia should incorporate the Dragonja river and include the portion of land up to the airport of Portorož, which means that the Fontanigge section of the salinas would belong to Croatia and Lera, to Slovenia. Other voices claim that the border should move further southwards, to the mouth of the river Mirna (Ballinger 2006,

[92] Place names in this region may have a variety of written forms –they may be bilingual, may be written in the mother tongue of the author or have different historical versions. In this text, I use the English version, if it exists, or else the official language of the country where they are currently located (i.e. Slovenian toponyms for places located in Slovenia; Italian toponyms, for places in today's Italy, etc.).
[93] In Slovenia, a popular story goes around, about a barber who felt he had travelled "a lot", as he had been living in Austro-Hungary, Italy, Yugoslavia and Slovenia, despite never having actually left his barber shop (Vladimir Frantar, pers. comm.).

Pipan 2008). In any case, the line lies now at the southern edge of the Fontanigge salt ponds, which can only be accessed by a dirt road that exits from the stretch of road between the Slovene and Croatian border posts[94].

Brief history of salt production in Sečovlje

The first reference to salt making in the region is the donation of the salt pans of the Brioni islands, in today's Croatia, to the bishop of Poreč in 543 AD. During the Middle Ages, salt was being harvested in Trieste, Muggia, Koper, Izola, Piran and Vrsar. The development of the Venetian state saw the creation of new salt making sites in Istria, such as Servola and Aquilina and in fact it can be considered that they played a relevant role in the development of the Venetian Republic. More specifically, the first written reference to the salinas of Piran came in 1278, in the first statute of the town. In the 14th century, the salinas were improved by introducing the "Pag mode of salt making" (see below). The peak of production was reached in the 16th century, but the political as well as climatic[95] instability in the region made the salt making activity fluctuate. Also, Venetians preferred the salt of Piran, due to its quality, and the salt from Koper was exported to the hinterland. Because of the relevance of the salt making activity and trade in the region, it was said that "the town of Piran grew on salt" (Žagar *et al*. 2006).

The tensions between the Venetians and the Austrians in Istria, caused the systematic destruction of salt pans in Istria by the Venetians. Also, in 1557 the plague broke out in Piran and salt making came almost to a halt. A few decades later, as a result of Austro-Venetian wars and the increased production of salt in the Austrian mines, the trade of Adriatic salt declined. In addition, the weather dependence and the complex functioning of the lagoons made it easier to import salt from other Mediterranean salinas (Southern Adriatic, Aegean islands, Siciliy, Sardinia, Balearic Islands, Northern Africa, etc.). Hence, in the 18th century, large amounts of salt accumulated in the pans and warehouses, and salters were forced to dump part of it in the sea. The salinas were further deteriorated by the regular floods of the Drangonja river. Although these floods provided abundant sediments for the development of the salinas of Sečovlje, some were severe enough to destroy the salinas, as it happened in 1765, 1852 and 1896. After the latter, the river was slowed down by means of a diversion and it now runs south of the salinas (Apollonio 2005, Bonin 1995, 2001, 2009; Darovec 2001, Erceg 1994, Geister 2004, Žagar 1995a).

Due to the loss of the salt making sites in the Ionian and Aegean seas as a result of political conflict, the Venetian Republic tried to redevelop new salinas in the region. Despite these efforts, the decline of the salt making activity in Piran could only be reverted later, under the Austrians, who invested in their recovery and the salinas were again fully active and doing well. During the brief French rule (1805-1812), the Austrian policy of producing high quality salt and selling it at a high price was continued. At this time, the salt from Istria was distributed all over Europe (Carinthia and Styria in present-day Austria; Carniola and the Karst region in current Slovenia; Friuli in today's Italy or as far as The Netherlands and Scandinavia). It also reached the near East (Turkey) and even further (India, the Americas) (Bonin 1995).

[94] Although Croatia is a member of the EU since 2013, it has not yet signed the Schengen Agreement and hence border posts are being held. This means that one must carry an valid travel document and show it to the customs control to visit this section of the salinas (and the salt-making museum).

[95] Severe droughts were recorded during the 16th century (Ogrin 2002) and, at the turn of the 17-18th centuries, when a minimum of solar activity was registered (Paliska *et al.* 2015). This could be one of the reasons explaining a lower salt production in this period.

However, this period of splendour did not last long. Most of the salinas in the area of Trieste halted their activity already in 1822, although Muggia closed in the 1930s. In Slovenia, the salinas of Koper were still active at the beginning of the 20th century, being drained afterwards to prevent the spread of mosquito-borne diseases, such as malaria. In 1904 the Lera salt pans in Sečovlje, underwent reconstruction and rationalisation. The windmills traditionally used to elevate the seawater from lower to higher tracts were replaced by petrol-based mechanical pumps. The salinas of Piran as a whole (thus including Strunjan, Fazan in Lucija and Sečovlje) were in operation until the 1960s, and only Strunjan and Lera in Sečovlje remained active thereafter[96]. These were exploited as industrial saltworks for a brief period of time, in the seventies, but later returned to the "early Adriatic salt making methods[97] (Apollonio 2005, Benčič & Žagar 2002a, 2002b; Bonin 1995, 2009; Hocquet 1982, Žagar 1995a).

During the entire Venetian rule and even prior to it, the trade of salt was a monopoly, for which a specific body was created: the *Camerarii salis*, first cited in the 12th century. This evolved in 1243 into the so called *Salinieri dal mar* and later, replaced in 1272 by the *Provveditori al sal.* They supervised the state-owned salt pans and the construction of new salinas. At this time, over 1,200 crystallisation basins were under their control. One of the greatest challenges of the time was the fight against pirates. Also smuggling of salt –both by sea and land– was common, and severe penalties were applied to those who attempted it. However, salt could be freely traded within Istria (Bonin 1995, Žagar *et al*. 2006).

The patrimonialization process of the site

Artisanal salt from Piran

Salt making in the upper Adriatic differs from the typical Mediterranean technique. In the latter (e.g. Sardinia, Sicily, Aegean, Iberia…), salt is left to dry as a solid crust and is harvested a few times per season. The risk of suffering rainy days during the summer is higher in the upper Adriatic and therefore, salt had to be harvested every two or three days. An additional disadvantage of Mediterranean-style salt harvesting is that the basins contain not only sodium chloride, but all other salts (gypsum, magnesium) that precipitate before or after salt itself, thereby decreasing its quality and purity (Bonin 2009). A special feature of these salinas, is the protection of the salt making surface with *petola*, an artificially cultivated, 1-2 cm thick mat of gypsum, calcite, halite, clay and microorganisms, that provides solidity and elasticity to the bottom of the crystallizers. The *petola* is essential in the salt making technique of Piran, as it preserves brine to go through the bottom and ensures the production of clean salt, free of sediments (Deržek 2005, Kovač *et al.* 2013, Oren 2009, Sovinc 2011). Salters use special sandals with a large flat wooden sole, to avoid damaging the crust. *Petola* constitutes a distinct element of pride and sense of belonging among both salters and residents. This technical innovation was introduced in 1377, when the salinas adopted the "Pag mode of salt making" and is still in use (Benčič & Žagar 2002bč, Bonin 1995, Pahor & Poberaj 1963, Turk & Križan 2005). Later, in the 18th century, salters were instructed in the production of coarse salt by their colleagues from Trapani (Italy), a technique that did not work well, in hindsight (Bonin *et al.* 2002).

[96] Fazan was transformed into a marina. Urbanisation pressure remained high, especially for the smaller site, Strunjan.

[97] The salinas of Pag, in present-day Croatia, are also active, but were modernised as an industrial salt making site.

Work at the pans started after St. George's Day (24th of April): salters occupied their summer dwellings –there were 440 houses in the salinas– and left the town of Piran almost deserted[98]. Around 3,000 people could live on the saltpans during the harvest season. The first and foremost task was to obtain drinking water, which was women's work. The provision of freshwater was ensured by the presence of karst springs and groundwater deposits near the salinas. The first harvest usually came in May or June, although it was officially celebrated on the first weekend of July. During this time, men combined their work at the pans with labour at the fields. Women and children had to ensure enough water filled the basins. When needed, the *fleur de sel* or, as it is known in the area, *fioretta*, was used to slow down the crystallization process, by sprinkling it on the brine, as if to "sow" the brine. After the harvest of food grade salt, the remaining, highly concentrated brine or *acqua madre* was sold to the spas in Portorož (see below). The season ended officially on the 24th of August, the feast of St. Bartholomew. When the saltmaking season concluded, salters returned to their homes. The salt stored in the temporary repositories near the pans had to be transferred to the large, state-owned warehouses. During the winter, the yearly maintenance of the pans, dykes, channels and reservoirs was made and the quality of the next year's harvest depended on the care of this maintenance work. Thus, salters used to say "*d'inverno se fa el sal*" (salt is made during the winter). Before the start of the season, tools and devices were checked, and repaired or replaced if necessary. Thus, there were three important dates in the calendar of salt making (24th April, 1st weekend of July and 24th of August), which are now known as the "Fiestas of the Salters" and special cultural and folk events are organised on these days (Geister 2004, Sovinc 2011, Žagar 1995b).

The owners of the salt pans –over 280 in Piran at the end of the 19th century– rarely produced salt themselves; the vast majority of them were rich citizens, the municipality itself, cloisters or monasteries; and hired workers for that task. Those who did work on the salt pans or were hired, did so on a seasonal basis and came from Piran and its hinterland. The latter, known as salters or *capocultori*, leased the pans and cultivated them (Geister 2004, Žagar 1995a). The salters in Piran combined salt making with other agricultural activities, thereby hoping for a dry and a wet summer at the same time. The protection of the saltworks relied on the Italian population and hence the abundance of Italian terms related to the salt making activity (Žagar 1995a, Zudič Antonič 2005). In the Austrian period, before the saltpans were bought by the state in 1904, the *Salt Consortium* regulated the work conditions in the salinas, as well as the contractual relations between owners and hired workers, who split their earnings in half and the latter had the right to stay in a salter's house (Žagar 1995a).

In Lera –as well as in Strunjan–, salt is still being produced according to the mediaeval tradition, although both sites underwent partial modernisation in 1904, under Austro-Hungarian regime. At that time, the state bought 525 salt fields. These have now a regular, geometric pattern and crystallization basins are concentrated to facilitate the harvest. This included the construction of rails to allow the salt to be loaded onto waggons and haul it to the nearby storage facilities. In Fontanigge, the salt making activity was halted in the 1960s, and part of the salinas were destroyed, leaving only some of the infrastructures and the remains of some salters' houses, to undergo an aquaculture development project which never came from the ground. However, the traditional, irregular mediaeval pattern can still be appreciated (Benčič & Žagar 2002, Žagar *et al*. 2006).

[98] Today, the local community gathers in March to clean the salinas. It is an opportunity to bond and, in exchange, they get free entrance tickets to the salinas.

The modernisation of the Lera salinas implied that one single salt worker could not be in charge of the whole production process. The provision of brine was organised for the salina as a whole and the salters could focus on the harvesting of salt in the crystallisation basins, which were laid in a regular pattern. This technological improvement increased the efficiency of the process, while respecting the natural method of concentration and crystallisation (Geister 2004). After WW II, formal training for the production of salt was introduced in Yugoslavia. Salters from Piran were instructed in Ulcinj, an industrial salt making site in Montenegro, and the Velenje Mining School in Slovenia also introduced a course for salters. Two training levels were offered, basic and advanced, the first comprising 704 hours, delivered during one season (April to December). Trainees were under the supervision of an experienced instructor. Later, the ALAS project (1999-2002) tried to recover this transfer of know-how with the design of a three-year training programme with a total of 3,548 hours. However, this programme is currently not in force (Bonin *et al.* 2002).

In summary, in the second half of the 20th century, as a consequence of this shift in salt making methods, together with the growing competition of cheap salt from Northern Africa and a dwindling interest in salt making as a whole (perhaps also owing to the general depopulation experienced in the area after WW II), the artisanal mode of salt making was all but lost (Brilly & Globevnik 2003, Polajnar 2008, Sovinc 2011). In the 60s, it was difficult to find seasonal salt workers. The tourism and industrial development in Portorož and Koper, respectively, attracted these former salters with more stable employment opportunities and workers had to be recruited elsewhere, mainly from the hinterland of Croatian Istria or even from Bosnia. The salinas of Piran were acquired in 1964 by the company *Začimba (*later to be renamed *Droga Portoroz d.d.*), from Portorož, specialised in the trade of spices. The company proposed some changes that reduced the need of seasonal workers, although it still remained a problem.

In those years, plans were made to upgrade the production scale to industrial, so that the harvest would be doubled and the number of workers, reduced. The permit to exploit mineral raw materials at Fontanigge, Lera, Fazan and Strunjan, as well as the concession for a permanent use of land and buildings of social property in this area, were obtained under the brand *Piranske soline*, created *ad hoc*. This industrialisation plan was inspired in a reconstruction project tah had been done in Brazil, but due to the huge investments needed, it did not get off the ground (Polajnar 2008, Savnik 1965). The huge maintenance costs and relatively low production rate, forced the closure of the Fontanigge and Fazan sectors in 1967. Further studies to improve production in Lera and Strunjan were made, without much success. Given the prolongued ballast effect for its global business, in 1988, *Droga Portorož d.d.* created a daughter company, *SOLINE Pridelava d.o.o.* (Salt production Ltd.).

After the declaration of the Sečovlje Salina Nature Park, the Municipality of Piran suggested that *Droga Portorož d.d*. should manage both the Nature Park and the salt-production in this area. Thus, the Slovenian state ceded the production of salt to the company *SOLINE Pridelava soli d.o.o*. which became, in 2000, officially the manager of the Nature Park. Two years later, with the acquisition of *SOLINE Pridelava soli d.o.o*. by *Mobitel d.d.,* the largest Slovenian telephone company, the financial situation of the salinas improved significantly and a true recovery process could finally start. From this point on, the recovery of the salinas would lean on three axes: nature protection, cultural heritage dissemination and economic development around salt making, salt tourism and small complementary activities, including the health uses of brine, *fango* and salt itself. These axes should each be identifiable under a specific brand (Deržek 2002, Faganel & Trnavčevič 2012, see also URL: http//www.soline.si).

At the turn of the millenium, 593 hectares of salt making surface were recovered in Fontanigge (only for the provision of brine) and in Lera (for the whole salt making process, which accounted for 25 salt making fields). In 2002, 18 men were employed, who produced 100 tonnes of salt. A decade later, over 94 hired workers produce up to 5,000 tonnes of salt and 30 tonnes of *fleur de sel* per year, maintain the water management infrastructures and take care of the natural habitats and visitor facilities. From the point of view of management, *SOLINE Pridelava d.o.o.* has the concession over the management and use of the park, by agreement with the government of Slovenia, but the land itself and the built infrastructures (dykes, salt-pans, buildings) are almost entirely owned by the state[99]. The company is allowed to implement traditional salt making, compatible with the maintenance of the natural and cultural values of the site. Authorised activities include tourism, yachting and aquaculture. Visitors can also experience salt making themselves.

Among its duties, *SOLINE Pridelava d.o.o*. should provide public services for visitors as well as the protection of the natural values and the management of water infrastructures, which in turn ensure the protection of the site against floods. In return, the Republic of Slovenia gives funding for these tasks, although the amount provided (8% of the total budget) is deemed insufficient for these costs, which have to be covered with the revenues of the company (Klavdij Godnič, *SOLINE Pridelava d.o.o*., pers. comm.). In addition, the concession contract states that all the assets and investments in the infrastructure of the natural park will remain as property of the Republic of Slovenia, also after the expiry of the concession contract in 2023 (Faganel & Trnavčevič 2012, Franceschetti *et al.* 2012, Sovinc 2009, 2011, 2012; Sovinc & Lužnik 2007).

The salt is obtained in the salinas of Sečovlje and Strunjan and stored temporarily in piles. From there, the salt is trasnferred to one of the warehouses in Portorož, where it is prepared for expedition. Besides from the sales points on site (Lera, Fontanigge, local shops), *SOLINE Pridelava d.o.o.* has seven exclusive outlets in the main cities of Slovenia (in Portorož and Piran, but also Ljubljana, Maribor, Bled…), sells its salt in about 50 retail stores all over the country and is exporting it to 17 other countries worldwide. The company also cooperates with well-known chefs to promote its salt. The modern production of salt, although respectful of natural cycles and processes, follows strict modern regulations with respect to quality. The extraction, preparation and packaging of salt complies with the requirements of the HACCP system[100]. To this end, a specific packaging plant has been built in Lera in 2013. In addition, the salt from Piran has been acknowledged with both Slovenian as EU PDO labels *Piranska sol*, granted to the sea salt obtained exclusively from the Sečovlje and Strunjan saltpans (Franceschetti *et al.* 2012). *SOLINE Pridelava d.o.o*. has developed two main brands, the old *Piranske Soline (*also labelled as *SoInce)*, with the old logo of the salinas, which is used for all products related to traditional salt and food. These include *fleur de sel*, natural salt and iodized salt harvested both in Sečovlje and Strunjan, increasingly popular in high-end Slovenian restaurants; as well as other food items with added salt, such as chocolates or pretzels. The brand *Lepa Vida* (see below) is devoted to products related to wellness, cosmetics and therapy. The park also sells souvenirs such as the typical salters hats and sandals, salt cellars or other merchandising products (Faganel & Trnavčevič 2012, Gočnik 2012).

[99] The rest being owned by the Municipality of Piran and some minor private owners. In any case, no human settlements exist within the park (Sovinc 2012).

[100] "Hazard analysis and critical control points" or HACCP is a food safety management system that follows the international standard ISO 22000 FSMS 2005. HACCP prevents biological, chemical, and physical hazards in food production processes that can cause the finished product to be unsafe, and designs measurements to reduce these risks to a safe level.

Tourism in the saltworks

Tourism in the area of Piran was traditionally themed around wellness, especially in Portorož (see below). However, in the 1960s, the activity developed into a more leisurely, beach-style tourism (Faganel 2012, Pucer 2005). It currently offers a combination of beaches, nautical and gambling venues, with large transnational entertainment groups leading the business. The area has become popular among Italian, German, Austrian, Israeli and Russian visitors. The Slovenian tourism authorities have reacted to this somewhat uncontrolled development and insist in their strategic documents on the need to offer a sustainable form of tourism, based on the natural values of the country (Brezovec 2015, Faganel & Trnavčevič 2012, Gosar 2007, Jurinčič 2010). The tourism office in Piran has redefined the local strategy, which should focus on the axes: Piran, as a cultural monument; Portorož, the source of health, and Sečovlje, for nature lovers. All three axes have in fact a common feature: salt.

A key service for tourism is the Museum of Salt-Making. It was originally conceived in 1972, after an open letter by researcher Miroslav Pahor, which drew attention to the salt making buildings and infrastructures that had only a decade before been abandoned. He sensed that tourism could be attracted to these areas and that an open-air museum could contribute to preserve the old windmills and salters' houses. The intention to recover this heritage also included the salinas of Strunjan, still active, which were threatened by the construction of a marina in nearby Lucija. In 1984-85, experts of the Maritime Museum "Sergej Mašera" and the Interregional Office for the Preservation of Natural and Cultural Heritage in Piran evaluated the salinas and decided to locate the museum at the Giassi canal in the Fontanigge area (Ravnik 1995). The museum was built between 1989 and 1994 and renovation works were performed in 2002. In 2001, the Government of the Republic of Slovenia proclaimed the Museum of Salt-Making a "cultural property of national concern" and in 2004, the museum obtained the Europa Nostra award, thanks to its originality (Benčič & Žagar 2002, Žagar 1995a, Žagar *et al*. 2006).

The Museum of Salt-Making is one of the delegations of the Maritime Museum of Piran "Sergej Mašera", which also includes other ethnological and heritage collections in and around Piran. One of them, the collection of traditional shipbuilding and the development of water sports, is located in the Monfort building, one of the former salt warehouses in Portorož. The Museum of Salt-Making is distributed among three salters' houses in Fontanigge, which have been recovered for this purpose. One of them reproduces the residence of a salter's family. The lower storey was used as salt storage and the upper one was their dwelling. The other two buildings exhibit tools and panels with a detailed description of the history of the site. The access to the museum, between the Slovenian and Croatian border posts, is allowed only for pedestrians, cyclists and school buses; cars should be left at the start of the dirt road. From there, visitors need to walk 3 km until they reach the buildings, a distance that may deter many, especially if the weather is hot or rainy. It nevertheless receives around 10,000 visitors per year (Flavio Bonin & Franco Juri, Museum of Salt-Making, pers. comm.).

The museum is also actively involved in the protection of its heritage. Since 1999, international youth camps are being held in the museum, which include a 96-hour training period in historical and cultural issues, as well as practical work at the salinas. The museum also collaborates with universities, to provide practical work on different themes (maritime science, ethnology, tourism…) (Bonin *et al.* 2002). Many other remains of salters' houses exist in Fontanigge, but have been left as ruins. As said earlier, in the first half of the 19th century, over 440 such houses existed (as compared to 17 in Strunjan and 35 in Fazan at Lucija) (Žagar 1995a). Small warehouses existed, near the active pans, which were used

throughout the harvest season, and larger ones in the municipalities (four in Muggia, three in Koper and nine in Piran), to which the salt was brought by boat immediately after. In the late 1800s, three large warehouses in Lucija and Portorož (municipality of Piran) were built, which are still standing and in use[101] (Bonin 2009).

In 1999, the two salinas (Sečovlje, thus encompassing Lera and Fontanigge, and Strunjan), were protected as a cultural heritage. Apart from the museum at Fontanigge, the park has a visitor centre with an exhibit about salt and a video on the local salt history. Art exhibitions are occasionally on display and a yearly outdoor art manifestation, the *Genius Loci Lera* is held in the salina. In the month of July, the Salina Festival is held, to celebrate the cultural heritage of the site. Other activities in the park include weddings, yoga, pilates, team building…. Another small building hosts the shop, where salt, wellness products, books and other souvenirs can be found. The park receives 30,000 to 45,000 visitors per year, mainly during the summer. Half of the guided tours are conducted with schoolchildren. The salina can be accessed by boat or by road, and has a small network of paths (9,1 km) that can be used on foot or bicycle. With an entrance fee of 7 Euro per person, they constitute an important source of income for the company. This fee includes the entrance to the museum, a measure that intends to increase the numbers of visitors to the latter, given its difficult access (Faganel & Trnavčevič 2012, Franceschetti *et al.* 2012, Sovinc 2011, 2012).

The salinas of Strunjan, on the other hand, can be visited free of charge. During the year 2012, 665 visitors were registered for guided tours, but no data seem to exist on the total number of visitors. Most of them cross the park on their way to the beach and little promotion is done on its values. Two houses have been recovered in 2013, one of which serves as visitor centre and the other is used for administration purposes. Both Sečovlje and Strunjan are favourite spots for birdwatchers. Local ornithological associations, such as *Ixobrychus* or the *Association for Watching and Examination of Birds*, have also contributed in the past to the research on the local bird fauna. Today, this type of work is being carried out by professional researchers (Franceschetti *et al.* 2012, Jurinčič & Popič 2009).

Wellness, health and food around salt

As mentioned before, the main and almost exclusive economic activity in the region of Piran is tourism. It is said that the benedectine monks of the nearby San Lorenzo monastery frequented the area already in the 13th century, to profit from the healthy seaside climates, seawater baths, saline muds and mother lay (Faganel & Trnavčevič 2012, Glavaš & Kovac 2014, Pucer 2005). Later, in the late 19th century, the owner of a small chemical industry located in Portorož -which actually transformed salt into its constituents, chlorine and sodium, for industrial purposes- offered his premises for patients who needed exposure to the sea and salty air of the region. It became such a popular activity that he finally stopped his industrial activity and transformed the building into a thalassotherapy centre. Soon new sea- and salt-based cures were introduced, especially for rheumatism. The peak in the thalassotherapy activity was reached in 1913, just before WW I, with ca 7,250 guests coming from the other regions (Carniola, Dalmacia and Croatia) or abroad (Austria, Bohemia, Moravia, Galizia, Hungary, Germany, Russia, France, England and even Turkey, Egypt or America). Patients could also enjoy cultural and sports activities. Both World Wars caused a halt in the wellness

[101] One of them, the Montfort building, has been named above. The other one, the Grande building, is still used to store the salt. There seems to be a discussion of the pertinence of using this building for "industrial" purposes, as it is located within a tourist area, in which case, the salt making company will need to find an alternative location (Klavdij Godnič, *SOLINE Pridelava d.o.o.*, pers. comm.).

tourism in Portorož, which was renewed at the end of the 20th century, with the construction of new thermal baths in 1985. Today, three resorts have obtained the thermal health status in Strunjan and Portorož and a few others in the region offer wellness programmes, while yet others provide specific services such as pools, sauna, physiotherapy, etc. A number of wellness centres are under planning in nearby located Ankaran, Lucija and Izola (Jurinčič 2010).

In 2013, the company *SOLINE Pridelava d.o.o*. decided to invest in a thalassotherapy centre, to take advantage of the two subproducts of salt making with healing properties, namely the mud (also known as *fango* or *peloid*) and the mother lay or *acqua madre*. The complex, named Lepa Vida[102] after the folk legend of a girl who was kidnapped due to her beauty, was built within the natural protected area and has a total surface of 4,000 square metres. Available activities and treatments include sunbathing, swimming, massage, *acquagym*, *Kneipp* baths, brine baths, salt scrubs and mud treatments. In the near future, it hopes to offer additional treatments such as sauna, steam bath or halochambers. The spa also includes a small bar as well as the sale of beauty and wellness products. The facilities have been built with the philosophy of minimal environmental impact, using natural materials and energy and water saving mechanisms, as well as the use of natural substances both for maintenance tasks as for the treatments themselves. It is the only open air thalassotherapy centre in the area, thus opening only from spring to autumn. It has a capacity of 55 guests and does not admit children under 12, to preserve the intimacy and the calmness of the site. The centre also has an experimental basin for the development of therapeutic muds, in order to gain insight into how the marine sediment is transformed into this mud. The findings of the research will allow to produce quality peloid under controlled conditions and with guaranteed therapeutic properties (Glavaš *et al*. 2012, Glavaš & Kovac 2010, 2014).

The nature and culture background

The Sečovlje salt pans are today the largest coastal marsh wetlands in the country (650 hectares, of which 552 ha are water and 98 ha, land surface), being the second largest in the Adriatic after Ulcinj in Montenegro. At the same time, they are the most important Slovenian locality from the ornithological point of view. Based on these facts, the Sečovlje Salina Nature Park, the Government of the Republic of Slovenia in the year 2001 declared the Sečovlje Salina Natural Park and the adjacent Museum of Salt-making has been protected as a cultural monument of national importance. In 1993, the salinas became the first Slovene wetland inscribed on the list of internationally important marshes under the auspices of the Ramsar convention. When Slovenia joined the EU in 2004, the park became automatically part of the Natura 2000 network. The nature park has a management plan in force, lasting from 2006 to 2015. It includes an analysis and assessment of the existing situation at the time of writing, it provides long-term and operative objectives, evaluation of performance as well as the investment plan. Not only the management plan is focused on salt making as a central issue, but even the decree designating the Nature Park stated that "the maintenance of traditional salt production is essential to conserve the rich and special biodiversity of the area" (Sovinc 2009).

The salina represents different ecosystems: the lower course of the river Dragonja, reed beds, the seashore, the levees and dykes of the salt pans, the mudflats of the abandoned salt ponds, the salt meadows and the salt pans themselves. The abandoned salter's houses are now home to a wide variety of animals, too.

[102] Lepa Vida means "lovely Vida". Vida is a girl's name in Slovenian.

This diversity of habitats exists partly due to the need to manage the seawater and transform it into brine, thus the salt making activity becomes a key issue in the management of the site. The area in and around the salinas of Piran hosts about 30 terrestrial halophyte species[103]. They usually grow on flat, intermittently inundated terrain, on permanently dry ground and on dunes and other elevated structures such as dykes, which are only covered with water during high tides (Geister 2004). But the salinas are best known for their bird fauna, which attracts ornithologists and other visitors. Over 270 species have been identified in the park and the salinas are an important breeding, wintering and stopover site for migratory birds[104]. Despite the human activity in the park (salt making, tourism), the active habitat and species management has resulted in an increase in breeding (Sovinc 2012). This ornithological richness has justified the declaration of the park as an Important Bird Area in 1989 (as well as the already mentioned protection instruments).

The area also qualifies as a Specially Protected Area of Mediterranean Importance, under the Barcelona Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean, adopted in 1995. Some voices also claim the declaration of a Transboundary Marine Protected Area[105] , namely the "Northern Adriatic Peace Park". Besides the necessary environmental criteria, this park could contribute to relieve political tensions between Croatia and Slovenia (Mackelworth 2011, see above).

The salinas of Strunjan are much smaller in comparison, with a surface of 428 ha, and have been protected as the Strunjan-Stjuža Nature Reserve and the Strunjan Landscape Park by the Slovenian government and the Municipality of Piran, respectively. They are also part of the Natura 2000 network (Breg Valjavec & Polajnar Horvat 2014). The salinas of Strunjan are managed by the authority of the park, although the salt that is being produced there, is marketed by *SOLINE Pridelava d.o.o.*. The salinas of Sečovlje and Strunjan and their related cultural heritage (e.g. the town of Piran) are being considered for the preparation of a candidateship as a UNESCO World Heritage site (Faganel & Trnavčevič 2012, Gačnik 2012).

[103] The most remarkable plants species are samphire (*Salicornia patula*), glasswort (*Arthrocnemum fruticossum*), sea purslane (*Halimione portucaloides*) or sea lavender (*Limonium angustifolium*), all of them typical of saline environments. Also of interest are the saline meadows to be found in the Fontanigge area, which have been left untouched by human activity (Stevens and Associates 2006). Some of these species were used as food by salters and sold them in the local markets. Different fish species can be found in the main canals, such as Giassi in Fontanigge. In the salinas themselves, the tooth carp (*Aphanius fasciatus*) is present. Crustaceans, such as the common shrimp (*Crangon crangon*) or the introduced Japanese tiger prawn (*Marsupenaeus japonicas*) and marine crab (*Carcinus aestuarii*) are typically found near the saltpans. The brine shrimp (*Artemia parthenogenetica*) is perhaps the most abundant in the salinas, as it can tolerate high levels of salinity. Another typical invertebrate is the brine fly (Fam. Ephydridae). Reptiles, amphibians and mammals are relatively rare, to be found in the higher portions of land or on the banks of the Dragonja river.

[104] The most typical ones are the black-winged stilt (*Himantopus himantopus*), common tern (*Sterna hirunda*), little tern (*S. albifrons*), Kentish plover (*Charadrius alexandrinus*) or the little egret (*Egretta garzetta*) (Beltram 2006, Geister 2004, Dilena 2005, Stevens and Associates 2006).

[105] Transboundary Conservation Areas or TBCA are protected areas that serve both the preservation of biodiversity as well as the promotion of peace and cooperation. Today, ca. 230 TBCAs exist worldwide, covering over 4,5 million hectares.

Current situation of the site: Good practices and challenges ahead

Good practices

The alliance between the different companies involved (*SOLINE Pridelava d.o.o., Mobitel d.d.*), the Slovenian state, the municipality of Piran and the nature and cultural conservation authorities, despite their flaws, seem to work well in favour of the sustainability of the site. In addition, the mother company, *Mobitel d.d.*, is a large, trustworthy company, which gives confidence to the institutions willing to invest or even provide credit for the recovery and maintenance of the salinas. However, the concession expires in 2023, after which a high level of incertitude about the future exists.

It is also worth noting that all the materials available for visitors (website, leaflets, products for sale) have a clean, clear and coherent design. The use of attractive photographs, the balance between the practical and background information provided and the use of five different languages in most materials, clearly enhance the visibility of the site's values and contribute to a good experience by the visitor.

Challenges

The multiplicity of authorities in charge of the salinas (Ministry of Culture, Ministry of Environment and Space, Municipality of Piran, *SOLINE Pridelava d.o.o.*, etc.) inevitably created friction and minor disagreements, although the overall result of their (coordinated) actions seems positive. However, there seems to be an overall lack of collaboration with other stakeholders, such as land users, neighbouring businesses and the local community in general, although their dependence on tourism for revenues is slowly changing this aspect (Breg Valjavec & Polajnar Horvat 2014, Faganel & Trnavčevič 2012). This lack of collaboration may stem from a culture of low participation, as people were used to having their decisions taken by others, during the communist regime and prior to that. In relation to this, an additional challenge is the threat of the mother company being sold to a large telecommunications company (probably Deutsche Telekom) and it is uncertain what the latter plans to do with the salinas.

From the management point of view, one important weakness is that salt workers are seasonal and change frequently; few are experienced and capable of training others. Since no formal training program exists today, new salter need to learn from veterans (Faganel & Trnavčevič 2012). Also, saltworkers are hired as freelance workers, and this may deter many from engaging in a physically demanding activity with a high weather dependence and at high economic risk.

Accessibility to both salinas and the museum of salt making may be an issue. Parking in Strunjan is difficult, as visitors need to leave their cars on the shoulder of the road. In Lera, there is enough parking space, but visitors need to walk 1,5 km to reach the visitor centre, whereas the museum can only be reached after passing one of the border controls and walking or cycling 3 km. Although the terrain is flat and usually dry during the summer, access with wheelchairs is virtually impossible or, at the least, uncomfortable (Franceschetti *et al.* 2012). The Museum of Salt-Making also has limited visiting hours. It is not connected to the electrical grid, thus it depends on daylight (Faganel & Bratina 2008).

Despite the efforts of the tourism authorities to create a coherent discourse around the natural and cultural heritage of Piran, there is not a common, visible identity for places as different as Piran (historical centre), Portorož (beaches, casinos and spas) and the rest of the municipality (rural area). Perhaps as a consequence of this, the salt is hardly visible on the streets. It can be found on site and in a specialised retail shop in the centre of Piran, but is hard to be spotted elsewhere (e.g. on restaurants, souvenir shops). The salt itself recently won an award as the "best souvenir from Slovenia" and this is now likely to change.

The growing tourism industry around Portorož is posing additional demands that may interfere with the sustainability of the project and offer an incoherent image to the visitors. The tourism lobby is demanding the creation of a golf course, for which a minimum surface of 60 hectares is needed. A portion of land between Sečovlje and the airport of Portorož has been identified as suitable for this purpose (Jurinčič 2010). The nearby airport of Portorož is already producing occasional noise pollution, but the larger tourism companies are lobbying to lengthen the runway to admit larger aircraft and increase the capacity of the airport (Faganel 2012). On the other hand, the ever-growing numbers of visitors cause an increase in untreated wastewater reaching the sea and potentially affecting the quality of the salt (Geister 2004).

Maritime transport in the area may be a cause of pollution, primarily due to accidents and spills during routine operations such as loading, discharging and bunkering in ports or at oil terminals. The Gulf of Trieste is rather shallow and its *cul-de-sac* shape, make it very sensitive to pollution (Perkovič *et al.* 2009).

Finally, sea level rise is another issue of concern for the salinas of Sečovlje. It has been modelled that the sea risks rising to 10 cm in the coming years, which means losing 54% of the habitats included in the Nature Park (Kaligarič & Invanšič 2014).

Conclusions

The salinas of Sečovlje benefit from the coordinated action of the different managers of the site (owners, local and national authorities). In a relatively short span of time, the salinas were recovered from a dwindling pre-industrial operation to a full scale artisanal activity, without any important conflict or resentment from any of the stakeholders involved. They have managed to create a common brand for their different products and services, with a coherent message of sustainability. Given the fact that this process has taken place smoothly in a complex region from the geopolitical point of view, just after the transition from a communist to a capitalist regime, only adds merit. Perhaps, the homework left to do is to improve communication between natural and cultural conservation authorities, as well as with other stakeholders present in the territory. In addition, care should be taken not to transform this message of sustainability and care for nature and culture into an elitist one, an ever present risk in these patrimonailisation processes.

6.3.3 The saltworks of Læsø (Denmark)

Bird's eye perspective of the salt seething huts in Læsø (©Katia Hueso)

Landscape of Rønnerne in spring (©Læsø Turistbureau)

The Vellev-Langballe seething hut, the first to be reconstructed (©Katia Hueso)

Inside the seething hut, with seeping salt baskets in the background (©Katia Hueso)

Læsø Kur in the deconsecrated church of Vesterø Havn (©Læsø Turistbureau)

A group of salt scholars bathing in saturated brine during the social programme of the International Salt Conference held in 2008 (©Katia Hueso)

Figure 6.5: Images of Læsø and its saltworks

Description of the island

The island of Læsø is located in the Kattegat strait, between the eastern coast of northern Jutland and southwestern coasts of Sweden and Norway. It has an area of approx. 114 square kilometres and an essentially flat terrain. The island has 1,817 inhabitants[106], a number that has been decreasing by a rate of 35% in the past years (Christensen 2008). The inhabitants of the island are comparatively aged, and there is a high unemployment rate, as well as a generalised dependence on subsidies and public aids. Aside from tourism, the private sector is focused on productive activities such as fishing[107] and small-scale agriculture, with a low level of professional qualification and a slow and costly transportation to the mainland (Mørtensen & Olsen 2005)[108].

The island had a historically strategic position for merchant shipping, as it is located in the middle of the Kattegat, a necessary passage from the North Sea to the Baltic Sea. Goods traded between south- and western Europe and some of the Hanseatic cities, had to pass through the Kattegat. From here, access was granted to the nearby regions of Jutland, the Danish islands (where Copenhagen and other main cities are located); Scania, Halland and Bohuslän, in today's Sweden; the Oslo Fjord and other parts of southern Norway. Also, of course, to the rest of the Baltic region. Typical goods to exchange were grain, timber and, naturally, salt (Hansen 2010, Stocklund 1985).

Læsø is one of the youngest landscapes of Denmark. The island emerged as a small triangular-shaped shoal in the Late Stone Age, ca. 5,000 years ago, disappearing under the sea for some time and re-emerging 3,000 years ago, together with the rest of North Jutland. It flooded and re-emerged again in 700 BC. Ever since, Læsø has grown continuously as a result of land uplift and sea deposits of sand, a process that is ongoing. In the last 50 years alone, this has led to distinct enlargement of emerged land especially in the southeast and west parts of the island, also known as *Rønnerne* or "the shoals". This part of the island only emerged in the Middle Ages (12th-13th centuries). With the rising of the sea bed, four islets (Færøn, Langerøn, Kringelrøn and Hornfiskrøn, where the present-day saltworks are located) were formed not earlier than 1,000 years ago from the sea to the south of Læsø. These islets gradually coalesced into a single large expanse, hence the toponym Rønnerne (Hansen 1994, 2010; Jørgensen 2002, Mørtensen & Olsen 2005).

The climate of Læsø is relatively dry, as compared to the rest of Denmark. It lies on the so-called "desert-belt", which stretches from the Great Belt to the northern Kattegat, an area with half the average summer precipitation than the rest of the country. This climate favours the accumulation of brine in the underground deposits, as shall be explained below.

[106] Data for 2016 obtained in from URL: http://www.statistikbanken.dk [Retrieved April 2016]
[107] With a turnover of approx. 10 million Euro (currency conversion according to the Euro foreign exchange reference rates of the European Central Bank on 2 March 2017), fishing is a relevant activity in the island. Most of the profit comes from Norwegian lobster (*Nephrops norvegicus*)
[108] The ferry crossing from and to Frederikshavn, in the mainland, takes 90 minutes and there are between 3 and 7 daily services, depending on the day and the season. Dangerous goods and solid waste are ferried once a week, during the first service. Special regulations for passengers and vehicles apply in this case.

Brief history of salt production in Læsø

Salt production in Denmark has been going on for centuries; certainly between the 13th and the 19th centuries (Vellev 2000). The main production sites were found in Jutland, and salt was only obtained sporadically in the big islands: Fyn, Sjælland, Lolland, etc.. Up to the 18th century, salt was being obtained in several locations of East Jutland by burning and washing the ashes of *tang*, a type of seaweed, and subsequently simmering the brine that resulted from the process of washing the ashes. The resulting salt was generally grey and bitter. This method was commonly used until foreign salt became cheaper in the Danish market. Sea salt was imported from Spain, Portugal and France, which travelled around Jutland to reach the Baltic. Salt from the Hanseatic city of Lüneburg was also imported at this time. However, during the Napoleonic wars (1803-1815), the import of salt was halted and salt made from *tang* was again produced. In northern Frisia, salt was produced by burning salt-saturated peat, found near the coast thanks to the amplitude of the tides, a method also known as *darinckdelven* in the Low Lands. This method was known to be in use between the 13th and the 18th centuries. On the other hand, Western Jutland did not host any salt production site of relevance, although some documents provide evidence of a partial solar evaporation method in this region (Vellev 2000). Much later, in 1966, salt production started at industrial scale in Mariager, northern Jutland, where a large underground rock salt deposit in the form of a diapir is found. The solid rock is dissolved with the injection of water at high pressure and the salt is then obtained by a vacuum evaporation process. The Mariager plant belongs today to the Dutch company *AkZo Nobel* and is still in operation (Sørensen 2012).

The most striking case of salt making in Denmark were the Læsø saltworks, which took advantage of the specific geomorphological features of the island to obtain a concentrated brine from the underground at shallow depths (ca. 0,5 m), saving large amounts of fuel. The salt from Læsø was also whiter and of better quality than other Danish salts, made by sleeching. It should be borne in mind that salt production in northern Europe was expensive in terms of the resources needed (boiling seawater by burning wood, algae, peat, etc.) or the investment of significant amounts of time (partial evaporation of sea water by exposure to wind in graduation towers, or exposure to the sun on wooden or clay trays). This geomorphological feature –explained below– that allows the natural accumulation of brine six times more concentrated than seawater is unique in northern Europe and salt from Læsø earned a strong competitive advantage. In addition, by concentrating the brine beneath the surface, the salt appeared free of impurities and dirt (Hansen 2001, Mørtensen & Olsen 2005).

The saltworks of Læsø were located in Rønnerne, the flatland south of the island. In this area, brine deposits are formed from stagnating seawater that enter the area during spring tides, storms, etc. These deposits or wells –hundreds of them existed– were formed in the intersections of the different *rønner*, which were in origin separated clay-bottomed islets with an elevation that never exceeds 3 m a.s.l.. The soil in this part of the island is composed mainly of clay, on top of which lies a layer of sand. Rainwater, less dense than salt water, runs off towards lower lying portions of the land, whereas the brine leaches through the sand into the underlying layer of clay, where it stays confined, without a connection back to the sea. The brine could reach a concentration of 12-15% (four to six times that of seawater), but this natural concentration process can take up to 40 years. These confined pockets of brine were used for salt making throughout history. Archaeological research (see below) has shown that salt was obtained on this island in small seething huts, where the brine simmered in rectangular iron boilers. In the eastern part of Kringelrøn and in Langerøn, even natural evaporation of brine took place (Christensen 2005, Hansen 1994, 1995; Johannsen 1984, Jørgensen 2002, Stoklund 2007, Vellev 2000, 2006).

It is estimated that the island of Læsø was inhabited since the early 12th century, when the King donated the island to the Bishop of Viborg, and was quickly settled. Since the land was not very fertile for agriculture, it is believed that salt production was the main driver of this demographic explosion (Stoklund 1985, 2007). It is speculated that salt making in Læsø started around 1150, although the first documented evidence of salt production dates to 1330, in a period of expansion that took place in the first half of the 14th century (Klitgaard 1937, Stiesdal 1949). Although the production of salt grew steadily, with a peak around 1500-1570, dips were registered around 1250 –during the Little Ice Age– and between 1400 and 1450. This first document was written shortly after the beginning of the domination of the Bishop of Viborg on the island, who obtained income from the production of salt. Farmers worked the land owned by the bishopric, where the seething huts were located. The salt huts belonged either to the church or to private owners, but a tithe needed to be paid to the church. Taxes were paid in salt and in exchange for two main services: the right to farm (nl. *bolesalt*) or simply for the use of seething pans (nl. *skuresalt*). Although the payment of these tithes is relatively well documented, it is difficult to calculate the total production of salt on the island. Remains of over 1,700 huts have been found scattered in the south of the island, dating from different periods of time. With this figure in mind, estimates of the total production of salt could have ranged from 650 to 2,000 tonnes per year during the peak period, the fifteenth century. The calculations are based on the assumption that the seething pans were in operation round-the-clock between April and September, plus that no major breaks or difficulties arose during the process. The number of inhabitants of the island at that time can be inferred accordingly: based on the fact that 8-10 people were needed for the maintenance of one seething hut, whether for salt making or the provision of fuel.

At the peak of production, around 1,200 people were employed directly in the salt making activity, and a similar number of people were probably engaged in indirect activities. In addition, sailors, craftsmen and other professionals related to trade and sailing should also be added. Also, 135 farms existed in Læsø in 1600, which ensured the provision of food. All in all, a total between 3,000-4,000 people must have lived on the island between in the late 16th century, and had a direct or indirect relation to salt making. Given the size of the operations and the degree of organisation, some authors speak of salt making in Læsø as the earliest industrial activity in Denmark (Hansen 1994, 1995, 2010, 2012; Vellev 1991, 2000, 2006). Salt from Læsø was exported to the Danish provinces of southern Norway (in today's southern Norway and southwestern Sweden). It was not clear what uses were given to this salt. Part of it was apparently used in Jutland or even in Scania for salting herring, although in the latter region the influence of trade of the Hanseatic League was strong and salt from Lüneburg was predominant. Already since the mid-fifteenth century there was a deficit of wood to be used as fuel for the production of salt, which eventually led to the decision to cease salt making in the island in 1652. By this time, the population of Læsø was probably half that of the peak production period. After this date, some seethers were allowed to produce salt for their own use, with much effort and little success (Hansen 2010, Johannsen 1984, Stoklund 2007, Vellev 2000, 2001).

The reasons why the successful production of salt was halted by decree in 1652 were, in fact, both of economic and ecological order. On the one hand, the Læsø salt could not compete on price or quality with the sea salts from southwestern Europe, which were flooding the northern European markets. On the other hand, salt production on the island had two major limiting factors: the availability of fuel and of that of shallow hypersaline groundwater. The overexploitation of salt eventually caused an ecological collapse, as the reserves of the necessary firewood and peat for boiling the brine had apparently been depleted (Øster Mortensen 2013, Voss 2011). Some authors also indicate climate change as a possible cause of the decline in salt making, which brought wetter and colder conditions after 1585, which

in turn limited the amount of concentrated brine. Another hypothesis is that the increase in population caused an overexploitation of the islands agricultural carrying capacity, arguing that the bishopric had already been aware of the scarcity of firewood and protected the forests against overexploitation (Hansen 2010, Stocklund 1985, 2007).

In the 16th century, as a result of the decline in salt production, part of the population started to engage in maritime trade. Privileges were obtained for the distribution of grain, which was exported to Norway in exchange for timber. For some time, the salt making activity could be extended and the provision of wood as fuel and building material was ensured. Later in the timber crisis, wood for fuel was replaced by peat, and its overexploitation resulted in the loss of fertile soil necessary for forest regeneration and agricultural practice. Although the ban to produce salt in 1652 arrived just in time to save some forested plots, they eventually disappeared during the wars with Sweden in the 17th century, but most especially during the Great Northern War between 1700-1720. Also, English sea pirates may have set fire to the forests to loot the islander's belongings. Because of the depletion of timber, the use of peat as fuel, both for saltmaking as for other purposes, accelerated the occurrence of sand drifts, the island becoming a large sandy area. This landscape dominated from the sixteenth to eighteenth centuries, covering wetlands, previous productive lands and even urban areas with sand drift of Aeolian origin. The accumulated sand slowly led to a new stage of ecological succession, the heath. This in turn gave way to new forests, although this time in the form of plantations, already in the twentieth century (Hansen 2010, Jørgensen 2002, Stoklund 2007, Vellev 2000, 2001, Voss 2011).

Later, in the 1720s, a salt making "factory" was built in Kringelrøn by Dr. Bister, although it is not clear from the remains how it should have worked. It seems to have had a couple of pans and, according to Dr. Bister's own accounts, "machinery" was used to make the process more efficient. He managed to produce some salt, but a few years later had to abandon his project due to the shortage of wood. A similar facility, in Færøn, was built by Captain Mathiessen. Both were designed at a more industrial scale, rather than the rest of the seething huts, meant for individual operation. In the end, given the chronic lack of fuel and the final failure of both projects, a few remaining seethers turned to solar evaporation, forced by the trade embargo during the Napoleonic wars in the early nineteenth century. This salt –as well as the concentrated brine– was for self-consumption and was typically used in the preservation of fish and meat (Klitgaard 1937, Stoklund 2009). Salt makers simply dug holes on the terrain and let the brine concentrate and collected the wet salt that accumulated in them. Later, this system was upgraded to the construction of at least 200 shallow wooden boxes, the size of a not very large table, which were set on a sunny spot, holding a couple of centimetres-deep layer of brine. After four days of exposure to the sun and wind, salt could be obtained. The boxes had a lid that allowed sheltering the brine in case of rain or other unfavourable conditions. Salt making in solar evaporation boxes continued until 1850, when it finally was abandoned, as salt from abroad was readily available and much cheaper (Hansen 1995, 2010; Johannsen 1984, Klitgaard 1937, Stoklund 2007, Vellev 2000, 2001).

The patrimonialisation of the site

Artisanal salt from Læsø

In 1943 the first scientific expedition to the island took place, during which the remains of a salt seething hut were excavated (Stiesdal 1949). In 1957 and 1972 further archaeological excavations were carried out, but it was not until 1990 when systematic studies were done

on the remains of these huts. In total, about a dozen seething huts have been excavated to date, dating from the twelfth to the seventeenth century (Mørtensen & Olsen 2005, Stoklund 2007, Vellev 2000, 2006). From the results of the excavations in 1990 led by the Moesgård Museum in Århus, the architect Hans Langballe, by then working at the *Viborgs Stiftsmuseum*, in collaboration with archaeologist Jens Vellev, researcher at the University of Århus; geologist Jens Morten Hansen, engaged at the Danish Geological Survey, and Poul Christensen, leader of the School Workshop of Læsø, and with the support of a number of public institutions, decided to rebuild a salt seething hut. The goal of the project of recovering an old artisanal salt making site was partly to put Læsø on the map, by telling their unique story about salt, and partly to contribute to the archaeological knowledge on seething by making real-life experiments with the technical salt making process (Mørtensen & Olsen 2005, Tanvig 2007, Vellev 2000, 2006).

It was difficult to imagine how a salt seething hut and the boiling pans looked like and worked, as they had been abandoned for three centuries and no one could tell how the process took place (Stoklund 2007, Vellev 2000, 2001). In the absence of first-hand information on many technical and construction details, the promotors of the project had to seek inspiration in salt seething facilities such as Halle and Lüneburg in Germany or in Wieliczka, Poland (Stoklund 2007, Vellev 2000, 2006). The new seething huts finally opened on the 5th of June 1991 and they were soon able to show the first modern "harvest" of salt to the public.

Once the salt making facility could be opened to the public, it was decided that the visits should be free of charge. In exchange, the salt was sold at a high price, but that was justified as a support to cover the costs of the project. In the first years, the usual high costs derived from salaries were cut thanks to the participation of the school-workshop of the island, whose employees were hired to get the salt seething huts going. Already during the first season, 4,000 bags of 200 grams were sold. The bags featured the weapon of St. Knud's guild, the symbol of the island, with the idea that the holy man should provide protection. The initial plan was to sell the bags of salt only on site, as a souvenir of the visit. However, the public became interested in it as a product and demanded to buy it elsewhere, so it became necessary to market the salt outside the island. (Christensen 2005). In 2000, a turnover of about 270,000 Euro[109] was reached only in sales of salt, plus another 40,000 Euro for other products and services such as school visits, night tours, etc... At that time, the saltworks had 20 employees and had a revenue of 2,7 million Euro (Hueso & Carrasco 2010, Tanvig 2007). In the last years, some 70 tonnes of salt were produced annually, and the total turnover being 800,000 Euro.

The quality of the salt has improved significantly over the years. Today, the salt is sold at ca. 100 euros per kilo, in small bags and packages, in different sizes. Some of the salt is blended with herbs and sold as readymade spices for the preparation of fish, meat or game. Although the original bags are still being used, other packages made of plastic have been introduced, as they preserve the salt better from humidity and allow its sale in the best conditions. The local shop at the saltworks also sells bath salts, cosmetics made with salt, brine and/or mother lay; smoked salt, salt cellars and postcards. The selection is rather simple, but aesthetically effective, and it distils authenticity. Despite not having a defined marketing strategy, Læsø salt can be found at 300 outlets throughout Denmark, plus two in Sweden and Norway and about one hundred restaurants in Scandinavia use this salt (Steffensen 2001, Poul Christensen & Olav Juul Larsen, former mayor of Læsø, pers. comm.).

[109] For clarity, all currency is shown in Euro, based on an exchange rate of 1 Euro = 7,4 DKK (European Central Bank's Euro foreign exchange reference rates, obtained on 2 March 2017)

The reasons they argue in favour of this salt is that it represents a piece of Denmark's history, as a defence of the old traditions as opposed to product standardization and culinary globalization, while being a healthy quality product. The tradition of salt making in Læsø has thus an additional emotional value for those consuming it, as it involves much more than just a quality product. Despite all these reasons, the managers of the salt making site have not sought to benefit from quality labels and protected geographical indications, as they wish to keep their independence (Poul Christensen, saltmaster, pers. comm.). However, the island has a strong food identity, supported by other specialities such as Norwegian lobster, beef or organic vegetables and fruit. In 2016, Læsø salt was selected as finalist of the "National local food" contest by the supermarket chain *COOP*. In agreement with major food industries, Læsø salt is added to different products (crisps, butter, biscuits and even vodka!) and sold in different supermarket chains, both locally as elsewhere in Denmark. The origin of the salt is clearly marked on the label, as a token of higher quality and local pride. The salt itself is for sale not only in most local shops and quality food stores in Scandinavia, but also on the internet, allowing a direct global distribution.

More recently, business partners have been arising in faraway markets, such as Japan. On the other hand, the recent creation or enlargement of small scale salt seething projects in Norway and Iceland threaten to break the Scandinavian hegemony of Læsø salt, although these sites lack the historical weight and perhaps even the authenticity Læsø salt has.

Precisely with this idea in mind, special cultural activities around salt were also prepared from the very beginning. In the first years of operation, the *Læsø Saltsyder Laug* (an association of salt-interested people) was founded and continued until 2014. During this time, they edited a newsletter on the cultural life of Læsø and the news around the production of salt. Many salt seethers belonged to this association. The newsletter provided information about the production of salt, but also on anything else related to salt. Its members organised a number of social activities together and, if any of them happened to visit a salt making site abroad, it did not fail to publish it in the newsletter. All improvements on the saltworks are recorded in the newsletter. In 1997, to commemorate the 400th anniversary of an expedition to the island by church officials, leaving from the capital of the bishopric Viborg, an itinerant 5-act play was organised, *Saltets Vej* (The Salt Road). The company *Danseteater Pulcinella* was in charge of the event. The 200-km journey started in Viborg on the 21st June and left for the harbour of Sæby, from where 60 actors and volunteers sailed to the island. The event had a broad resonance in the Danish media (Vellev 1997, 2006). A few years later, in 2008, the saltworks organised an international conference on salt, with delegates from Spain, Italy, UK, Portugal, France, Germany, etc. The goal of the conference was to exchange information and offer delegates a vision of their success. Participants had the opportunity to visit the *AkZo Nobel* facilities in Mariager, a true world of difference from artisanal salt from Læsø. On the 5th of June 2016, the 25th anniversary of the Læsø saltworks was celebrated, with several events at the saltworks (demonstrations, talks, food tents, theatre, folk dance, etc.), including a holy mass at the church in Byrum, with the theme "Thou art the salt of the Earth".

Tourism in the saltworks

One of the strongest economic sectors in Læsø is tourism. Around 120.00 tourists arrive to the island every year. Most of them do so by car: the ferry brought ca. 60.000 private cars into Læsø in 2013. In addition, there are almost 1,000 summer houses on Læsø, most of them occupied a couple of months per year (Inzights 2015). Tourism is indeed an important activity, but it is markedly seasonal. More than 15,000 temporary residents can concentrate at any given time during the summer, seven-fold the number of permanent residents, which

translates in a heavy pressure on the island's services. The Læsø Development Strategy aims to improve the economic situation by encouraging innovative activities and tries to support young families who want to settle. It also intends to create a quality brand on Læsø, as a common identification element for the productive activities and services of the island, by giving it a unique and integrated identity (Læsø Kommune 2003, Nordbø 2001, Odgaard 2007). A recently finished European transnational cooperation project, *CREST*, aimed at creating a sustainable tourism activity on the island, by trying to flatten the seasonality peaks (Project CREST 2008).

Perhaps inspired by this project, the *Læsø Markedsførening*, an association devoted to the development of sustainable tourism in Læsø, has signed a cooperation agreement with the Tourism Office, the ferry company *Læsø K/S*, the museum, the salt making company Læsø Salt and the municipality. The agreement acknowledges the natural and cultural assets of the island and takes into account its limited carrying capacity (Jens Klixbühl, president of *Læsø Markedsførening*, pers. comm.). Among others, the association intends to promote special events, to train professional tourist guides, to participate in professional fairs and to produce written information for visitors. These efforts seem to be bearing their fruits: A close look at the very detailed 88-page long brochure of services edited by the tourist office, the island offers an overall coherent image of a slow lifestyle, with relatively calm outdoor activities, tasting local products[110] and admiring art and craftsmanship by local artists.

Thus, tourism in Læsø is clearly focused on experiencing nature at a slow pace. Not only the different stakeholders and official documents stress this, but also the visitors themselves (Project CREST 2008, Læsø Kommune 2003, Nordbø 2001). In this context, the experience of nature is closely related to the sustainable use of natural resources in the island, and visitors value local foods and crafts. Many of the products on offer are focused on the use of these resources, be it wool, seaweed, amber, salt… An often-used slogan says *Læsø: sol, strand, tang og salt* (Læsø: sun, beach, seaweed and salt), featuring these highlights. Also active visitors wishing to experience nature can do so on horseback, bicycle, etc. . The saltworks constitute a reference to be seen on their routes.

Following this train of thought, the new saltworks were never conceived as a museum, even though its main revenues come from tourism. Visits are still free of charge, because the site is considered a living place of production, in full operation. Visitors have the opportunity to enjoy half-hour guided visits, which are offered by the salt seethers themselves. Up to 3,000 visits are offered per year. To be able to guide visitors, they do not only need to learn the art of salt making, but receive specific training in communication skills. The talks have an informative component with a humorous, theatrical air, to which every salt seether adds his or her personal touch[111]. The dramatic component is further stressed by the hazy atmosphere in the huts, provided by the brine evaporating in the pans, and the scarce daylight squeezing through the willow-braided walls. The visit is so rewarding, that visitors perceive that the price of each bag is really worth it. It's all about having an "experience", to which a product is incorporated. In 2014, 60.000 visitors were received at the site, half of all the visitors arriving to the island. Almost 80% of them were Danish, while another 15% were Swedes and Norwegians, and 5% German. Other nationalities were hardly represented (Poul Christensen & Olav Juul Larsen, pers. comm.). Sometimes special events are held, some of which against

[110] Salt, seaweed, Norwegian lobsters, honey, organic farm products, wool and handicrafts are the main products of the island. The most popular outdoor activities are sailing, horseback riding, seal watching, golf, nature walks and cycling.

[111] Read for instance the description of the saltworks in Christensen (2005). It is a literal transcription of his story-telling craftsmanship.

payment of a fee. Examples of these activities are night visits, dramatized tour with meals, preparation of salt or bath salts by the visitor, nature walks in the area, etc. (Christensen 2005, Læsø Turistinformation 2008).

Wellness, health and food around salt

With respect to the impact on the overall economic activity of the island, there are several companies providing services to the salt making company, even though their fares are higher than their competitors on the mainland. An example of this are the bag manufacturers, who sew and print them on the island. This choice is seen as a commitment to support the local economy. Other local companies transform or use salt by-products, or take advantage of the salt as an identity of the island. Some businesses offer guided tours of the salt marshes, sell crafts of all kinds (which often includes salt shakers of various materials), or process cosmetics using salt, brine of mother lay from Læsø, prepare local delicatessen with Læsø salt and there even is a thalassotherapy centre. Of course, the salt itself can be found in most grocery stores and souvenir shops on the island as well as at the tourist office and the ferry that connects the island to the Jutland peninsula (Læsø Turistinformation 2008).

But perhaps the single most relevant new business associated to salt is the thalassotherapy centre *Læsø Kur*, which opened in 2008. The idea gained momentum when the saltworks received gradually more visitors interested in buying brine and mother lay (the latter was, at the time, a waste product of the salt making process) to be used as a treatment for skin diseases, mainly psoriasis. The project was already conceived in 2003 and building works began in 2007 in a deconsecrated church (Læsø Kommune 2003). In just over one year, the centre could offer all kinds of therapy services (sauna, steam bath, cool water pool, mother lay baths, jacuzzi, massage), leisure and beauty treatments. The centre came to an agreement with the Danish health system to offer packages for patients and, of course, anyone interested, could purchase their own wellness or therapy packages. The centre now has deals with hotels, which offer special prices for patients who need longer stays. Resident patients are offered additional therapeutic activities, such as nature walks or low-intensity sports, which complement the therapeutic effects of the treatments at the centre[112]. As *Læsø Kur* is specialised in psoriasis treatment, certified according to official quality standards (Weinreich *et al.* 2014), the Danish health services saves the money used to send psoriasis patients to the Dead sea area, before the centre was opened. Evidently, for all stakeholders involved (*Læsø Kur*, the Danish state and the patients themselves) this is a win-win situation[113].

Patients visiting the thalassotherapy centre *Læsø Kur* have also induced the strengthening or even creation of new visitor services, such as restaurants, art galleries and traditional handicrafts. New products and services are being created around the natural resources of the island, such as specialised nature tours or seaweed-based food and wellness products. The number of services in the island exceeds by far the expectation for a community of its size (Læsø Turistinformation 2008, Tanvig 2007). The different stakeholders, whether public

[112] This was not a smooth transition: The psoriasis patients who first arrived in the island had a lifestyle that did not match the calm and quite stay Læsø wants to offer visitors. Conflicts arose between these two groups around the use, for instance, of accommodation facilities. Today, specific accommodation is offered to long-term patients.

[113] In conversation with a group of patients, they declared being very happy that they could use this treatment in Denmark, because they could afford more frequent sessions and their family was not so far away.

or private, have joined forces in the creation of a common brand "Læsø" and support each other in offering an integrated, authentic image to visitors and customers (Læsø Kommune 2003).

Another case in point is the restaurant and delicatessen shop *Spegeriet*, which also opened in 2008, offering products of the island and other areas of Denmark, with special emphasis on quality and presentation. Associated to it, a high-level cooking school was planned to open. However, on a later visit in 2015, the restaurant had closed and the cooking school had not been opened. The ultimate reasons for this closure were not disclosed.

As for employment, of the 800 full-time workers active in Læsø, 20 are engaged in the salt making site[114], five were in the *Spegeriet* restaurant and 15 in the thalassotherapy centre *Læsø Kur*. This amounts to 5% of the human resources of the island. With respect to indirect employment, the salt influences seemingly solid business such as the passenger ferry, timber distribution, machinery repair services and electricity, masonry, plumbing businesses in the island. The visitors, initially attracted by the salt making site, take the opportunity to visit other attractions on the island, make use of hotel services, go shopping, etc. Therefore, it is estimated that the socioeconomic impact is relevant, although no exact figures are available (Olav Juul Larsen, pers. comm.).

The nature and culture background

Nature is a strong asset of the island's heritage. With a low population density and a predominantly rural lifestyle, visitors travel to Læsø in search of tranquillity, scenery and outdoor life (Nordbø 2001). Besides from beaches, the landscape is relatively flat, with some sandy dunes. The northern half of the island is forested, it is now being managed by a LIFE EU-funded project devoted to the protection of bird habitats. The project started in 2012 and is expected to last until 2017. This area is already protected as a Ramsar site since 1977 and as a Natura 2000 site since 1994, namely *Nordre Rønner*. The south is characterised by a landscape of tidal flats, salt meadows, heath moorland and small freshwater wetlands. It is largely uninhabited and hosts numerous birds and plants of conservation interest[115], including the only three species of insect eating plants found in Denmark. It is also brimming with bees and butterflies, some of which are protected or listed species. This half is also protected as a Natura 2000 site, namely South Læsø. Besides, there are local nature reserves, such as Boven-Knotten, in the eastern tip of the island, or the Klitplantage, a large forest in the north. With respect to salt-related nature, Rønnerne is dominated by naturally fluctuating saline habitats, which are colonised by species that can tolerate different degrees of salinity, such as bog hairgrass (*Deschampsia setacea*) and dune gentian (*Gentianella uliginosa*). These marshes have been protected by national law since 1980. Also, hypersaline landscape forms are found, such as saltpans, in which the groundwater is more saline than seawater. Few species are found here, except for blue-green algal mats and temporary vegetation. In long dry conditions, salt may crystallize on top of the sand (Hansen 1995).

[114] For comparison, the 10-12 salt seethers of Læsø produce 70 tonnes per year, whereas an industrial saltworks has 100-150 employees and produces 700.000 tonnes per year (Poul Christensen, pers. comm.).

[115] Especially listed waterbirds are turnstone (*Arenaria interpres*), avocet (*Recurvirostra avosetta*) or Arctic tern (*Sterna paradisiaea*), among many others. The area is also one of the most important moulding, stopover and wintering sites for seaducks in Denmark. Other typical species from this area are the common and grey seal (*Phoca vitulina* and *Halychoerus grypus*, respectively).

One of the most ambitious projects for Læsø is to become protected as a marine national park, which is planned to cover an area of sea of 1,330 square kilometres, including the whole island. The present saltworks would receive the consideration of a cultural-historical landscape and it was suggested that the old facilities designed by Dr. Bister and Captain Mathiessen (see above) could be recovered for a more thorough interpretation of the salt making history in Læsø (Mørtensen & Olsen 2005). However, the plan has been dismissed for the time being: the local community[116] felt reticent about it, because it was perceived as a limitation, rather than an opportunity, for local development. In a referendum held in 2008, the idea to declare a national park was rejected by a small difference (58% voted against and 42% in favour of the park) (Christensen 2008). However, the issue of protecting Læsø as a national park, keeps coming back in the media, the latest including a proposal to rewild the island (Larsen 2015).

The islanders seem also to be proud of their culture. Læsø has two open air museums: One of them, near Østerby Havn, is *Hedvigs Hus*, a traditional house of the island, and the other is the museum farm *På Lynget* (i.e. "on the heath"). The latter, much bigger, is a traditional manor house with its seaweed roof. It shows how rural life was in Læsø at the end of the 19th century. The museum does not exhibit salt-related objects or displays, but it sells publications and postcards about it. In addition, there is a small maritime museum at Vesterø Havn. At some point, there had been talks to bring the Danish salt museum to the island, but the municipality did not have enough resources to do so and it went to Mariager, instead. The saltworks decided explicitly not to open a salt-related museum, as they want to stress the idea of being a productive site, not a fossilized activity[117]. Festivals are also being organised, such as the *Jomfruhummerfestival*, celebrating the typical Norway lobster, on the first Saturday of August, as well as numerous smaller events around food, art or crafts year-round.

Current situation of the site: good practices and challenges ahead

Good practices

The salt heritage recovery project in Læsø can be considered extraordinary from several points of view. To start with, there was hardly any visible heritage to be recovered and it had not only to be reconstructed, but also "reinvented", as there was no one around to tell how it should be done. On the other hand, the managers of the salt making site show a strong sense of independence from seals, certificates and similar acknowledgements, but on the other hand are very collaborative towards the efforts of creating a common identitiy of the island. One fact that stands out after examining the information provided by most companies in Læsø (brochures, leaflets, websites…) is that all of them devote some space to explain the salt making history and procedure to their customers, even if the company is not directly linked to the saltworks.

[116] The lobster fisheries and part of the tourism sector felt strongly against any protection status and lobbied aggressively to avoid the declaration of national park (Karin Krogstrup, former nature guide at the saltworks, pers. comm.).

[117] Similar thoughts are heard in Guérande or Añana: "*Ce n'est pas une musée vivant, mais seulement 'vivant'*" (It's not a live museum, but only alive) (Gildas Buron, pers comm.).

Challenges

Although the future looks promising, the business of Læsø salt cannot grow *ad infinitum*. First, because the supply of wood is limited; second, because the brine cannot be replenished faster that it does. But mainly, but perhaps foremost, because the managers want to remain faithful to the original idea of recovering a lost tradition and not fall into the temptation of *disneyfication*. For this reason, the geographic scope of influence of Læsø salt remains mostly in Scandinavia. They feel it is their task to show the "Nordic" way of salt making and to promote local foods. The managers are, as of yet, not particularly worried about competing with artisanal salts from elsewhere in the region. The fact that projects such as *Spegeriet* did not root in the island should not be interpreted as a failure or even an omen, but rather as the fine tuning of the salt making activity in Læsø.

From the point of view of landscape, another possible threat is the construction of an offshore wind farm, which has been under discussion. However, the distribution and species composition of the birds in the Kattegat has so far prevented its construction (Petersen *et al.* 2003).

The long and costly transportation from the mainland to Læsø can be considered a weakness, as does the lack of technical expertise in the island, but it has been transformed into a strength by the local community. Læsø owes part of its charm, precisely, to its isolated condition, which has contributed to the creation of a very specific and well known identity, and the shaping of the spirit of entrepreneurship that characterises the islanders.

Conclusions

The saltworks of Læsø owe their success to being a unique, place-bound local development project, that cannot be replicated elsewhere. The success of Læsø salt relies on the strong story it tells, plus the result of a combination of local governance, local learning, stakeholder cooperation and return of the profit into the local community (Tanvig 2007). Although the saltworks do not establish strong partnerships with other salt making sites, they have created a tight social fabric in the island, not only creating a fair amount of jobs and business-related wealth, but especially generating a solid sense of pride and belonging. Læsø has its own brand in which salt has a protagonist role, and typical southern European ailments such as envy and suspicion are completely missing in this common effort. Their main challenge is now, how to keep the business running alive and well, within their self-imposed limits of identity (focus on Scandinavia) and resources (availability of fuel and brine).

6.4 The international scope of salt heritage

Although most sites have evolved individually, with their own human, technical and financial resources, European funds have proven to be a good resource to invest in the improvement of heritage, conservation measures and dissemination. Given the philosophy of European funding schemes, the need to find sources of co-financing has contributed to mobilise the commitment of local and regional funding bodies. In addition, European funds promote the cooperation between stakeholders, both on site as in different member states. This allows not only the exchange of knowledge and experience, but also the creation of a habitude of cooperation the increase of confidence and goodwill among stakeholders. Given the different timing of the three study sites, as well as their political-economic situation, the access to European funds have been varied. Also, none of the sites have coincided so far in transnational projects. However, the spirit of the different projects is rather similar, as can be seen in Table 6.3.

The salinas of Guérande have benefitted only occasionally from European funds, via different strands. The patrimonialization process took place in the area well before the generalised use of these funds and therefore have not been such a relevant source of funding. On the other hand, the salinas of Sečovlje, given the recent access of Slovenia to the EU, have been involved in numerous European projects, and EU funds constitute one of their main sources of income. Finally, the island of Læsø -a relatively poor region within one of the richest coutries in Europe- has been involved in a few EU-funded projects, most of which holding a holistic vision of the island as a sustainable tourism destination with high nature values.

Beyond the cohesive role of European funds, all three sites consider their heritage of outstanding value and coincide in their wish to present them as a candidate for the UNESCO World Heritage programme. Although UNESCO seems reticent to declare new World Heritage Sites in Europe, a joint candidateship would perhaps enhance their chances of success[118].

Table 6.3: European funded projects in the three European study sites

Funding programme	Years	Budget (Mill €)	Name & brief description
Guérande			
LIFE	1994-1996	0,2	*RAMSAR Programme* The project's overall objective was to promote the long-term rational and sustainable use of the 13 designated Ramsar wetlands in France, one of which is Guérande/Més. The project developed a promotional brochure to present and explain the national and international network of Ramsar sites for distribution at all 13 French Ramsar sites; put up information signs and interpretative boards and organised a training and awareness-raising programme.
INTERREG Atlantic Arc	2004-2007	5,5	*SAL Salt of the Atlantic: Valuing the identity of the salt marshes of the Atlantic. Recovery and promotion of the biological, economic and cultural potential of coastal wetlands* The project intended to promote salt production by traditional methods, associated to their landscapes and preserving their historical, cultural, social, economic and environmental values. The project had numerous branches related to its themes of interest, which resulted in a wealth of technical documents that analyse the current situation of Atlantic salinas and the future sustainable uses of these wetlands. But perhaps the most relevant outcome was the legal declaration of French Atlantic salt as an agricultural product. This allow *paludiers* to access support from EU's agrienvironmental measures of the CAP (della Valle 2016).

[118] Interestingly, the Spanish site with the highest score, Salinas de Añana, also tried to be nominated as a World Heritage Site. Given their experience preparing the candidate dossier, Salinas de Añana could be a good partner in this joint effort.

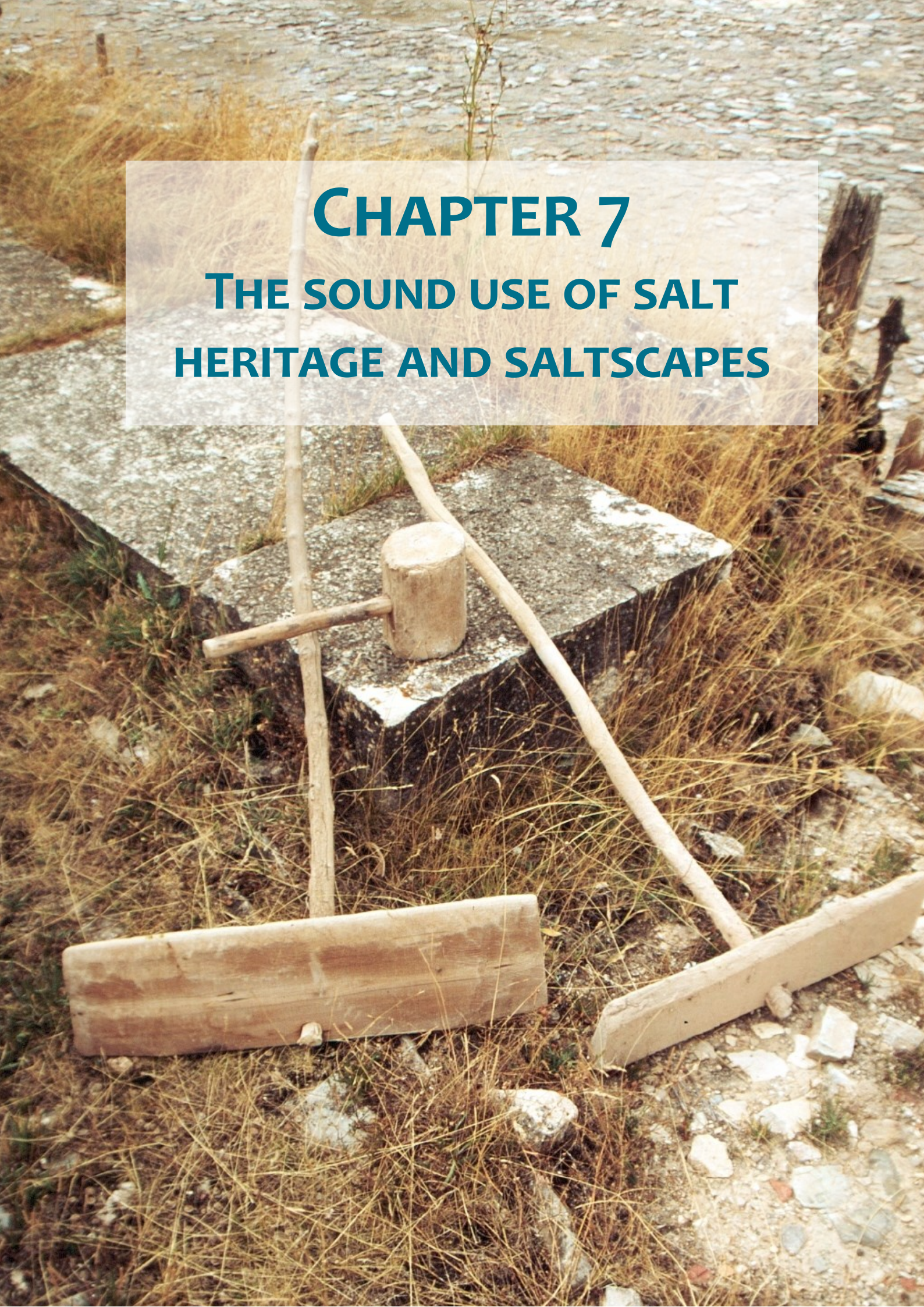
Table 6.3: European funded projects in the three study sites (Cont.)

Funding programme	Years	Budget (mill €)	Name & brief description
Sečovlje			
ERDF Phare	1999-2002	1,5	*ALAS – All About Salt* The project produced a wealth of technical reports and guidelines on eco-cultural tourism in salinas, salt museum management, habitat conservation and marketing of traditional salt. The local partners in Piran were responsible for training salters. Given the timing, the quality of the outputs and the geographical spread of the ALAS project, it is considered one of the major EU-funded projects around this issue. For more details, see also Chapter 4.
LIFE	2003-2006	0,7	*Conservation of endangered species and habitats in the in Sečovlje salt-pans* The project targeted the conservation of the natural habitats and species of Community interest. The main action comprised the restoration of the system of dykes and embankments and the creation of nesting islands, as breeding areas for terns. In addition, new channels were dug along the boundaries of the salt-pans to reduce predation and human disturbance.
ERDF Programme "Italy-Slovenia"	2010-2013	3,2	*Climaparks - Monitoring and study the effects of climate changes* The aim of the project was to perform research and raise the awareness of the public about climate change, conservation of biodiversity and sustainability in protected areas, at a global level. Field studies on climate change were performed in the salinas.
INTERREG Central Europe	2010-2013	3,2	*HABIT-CHANGE – Adaptive Management of Climate-induced Changes of Habitat Diversity in Protected Areas* The project aimed at evaluating, enhancing and adapting current management and conservation strategies in the protected area, in order to respond pro-actively to the influences of climate change that may threat habitat integrity and diversity. As a result, monitoring and risk assessment guidelines have been implemented.
LIFE	2010-2015	7	*MANSALT – Man and Nature in Sečovlje salt-pans* The goal of the project was to preserve biodiversity in the Sečovlje Salina Nature Park, more specifically, the protection of target bird, reptile and fish species as well as habitat types of the Natura 2000 site. To this end, the project tackled the reconstruction of frontal and high-water levees and other infrastructure, the construction of barriers against predators, as well as the ecological restoration of degraded habitats.
ERDF Programme "Slovenia-Croatia"	2010-2012	1,8	*REVITAS – Revitalisation of the Istrian hinterland and tourism in the Istrian hinterland* The project created a revitalisation model of the Istrian interior, with integrated tourist products, a tourist information network, joint cross-border education and cultural exchange, all of which expects to contribute to human resources development in the border area and the transfer of experience between Slovenian and Croatian Istria.
ERDF Programme "Italy-Slovenia"	2011-2014	1,2	*Saltworks – Ecologically sustainable enhancement of the saltpans between Italy and Slovenia* The main goals of the project were to improve the management of the salinas, to develop a sustainable form of tourism, the preservation of nature and traditions and to promote the production of salt.
Læsø			
INTERREG North Sea	2005-2008	0,5	*CREST - Creation of Sustainable Tourism Destinations* The project aimed at creating a joint definition of sustainable tourism destinations as such and to identify the factors for becoming one of them. As a result, a "CREST Toolkit with Recommended Actions for Creating a Sustainable Tourism Destination", was produced.
INTERREG North Sea	2009-2012	4	*Coast alive!* The project worked to develop best practices for boosting visitor numbers to the countryside while preventing the damage on local heritage. In addition, the project activities considered cultural and natural heritage as a means to improve public health, the development of SME's to give support to these activities and the demographic profile of the region.
LIFE	2012-2017	2	*LAESOE – Restoration of birdlife and natural habitats at Læsø* The project intends to establish a sustainable grazing system in order to improve the status of protected habitats, to secure the status of important breeding bird species, to control the invasion of alien plant species and to improve feeding conditions for migratory birds.

Source: Own elaboration

6.5 Conclusions

The three case studies in Europe have been selected by a combination of objective and subjective criteria, which have provided the joint impression of being places with a consolidated patrimonialization process and from which useful lessons can be drawn. In addition, the three cases have had very different starting points and have followed different roadmaps, but all have achieved a stable position in their process and now serve as models for others to follow. These initial differences are of social, historical, political and environmental nature and may only have salt making as a common feature, but the three sites have managed to put their salt on the map. A high quality, environmentally and socially conscious product and, last but not least, that tells a nice (hi-)story. A key issue in the patrimonialization of the three sites is the joint effort by stakeholders to achieve this outcome. While in Guérande and Læsø certain individuals or representatives of civil society have been key to the process, in Sečovlje, it has been more driven by institutions, with a top-down approach. But in all cases, the combined effort of public administrations -at different hierarchical and sectorial levels-, civil society and academia has been the recipe for success. Another important factor has been the understanding of the socio-environmental context: The sites have moved from the business of salt making to the business of heritage. Salt is the core of this new business, but also the trigger of other products and services that provide coherence and depth to the site. To this end, the managers have established links with the local community and with the cultural and natural assets the territory provides. It is not only salt that matters, it is the context that provides the added value. Depending on the site, these complementary products and services may pose the stress on gastronomy, tourism, nature conservation or health and wellness. In any case, the three sites provide a combination of them all. Visitors enjoy a range of activities and services around salt while residents delve on the (renewed) identitarian value it offers. Together, these activities ensure a livelihood for the local community and allow to diversify efforts and risks. This approach requires a complex management system, in which dialogue and participation are key in the initial phases of the patrimonialization process, but also requires being able to delegate it in professional hands once the process has been consolidated. The case studies presented here show that a sustainable management of salt heritage and saltscapes is possible, but it is not devoid of threats and pitfalls. The main challenge in these cases is how to grow within the business of heritage without losing the ties to the roots of the process, to the underlying cause that eventually triggered it. But, at the same time, the key is how to remain resilient to changes, while being flexible enough to adapt to the shifting needs of the local community, of society in general and of the landscape itself.



Chapter 7

The sound use of salt heritage and saltscapes

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7.1 Introduction

This chapter introduces the concept of "the trilogy of salt", that is, the combination of uses a saltscape can typically offer as a means to ensure sustainable development in and around a (former) salt making site. Although a salt making site is originally designed to produce salt, many other products and services can be offered, that are compatible and supportive of the salt making activity itself. These are classified in three large groups: Food and gastronomy, eco-cultural tourism and health and wellness. Food includes not only the salt itself, which can be presented in different formats and in combination with herbs, spices, etc., but also other food items, such as pickles, cured meats, glasswort, etc. A classification of salt according to different criteria is offered, focusing on what makes a salt sustainable. Derived from salt, non-food items can also be offered, such as mother lay or salt blocks. Ecocultural tourism provides an additional source of income by means of guides visits, salt museums and other activities in combination with the assets offered elsewhere in the territory. Salt-related events strengthen the effect of ecocultural tourism and may attract new visitors. Salt has always been a source of health and, today, saltscapes may offer a range of products (brine, mother lay, muds) and services (baths, inhalation, halotherapy) that contribute to one's wellbeing and health. All these activities are framed by the natural and cultural context each saltscape has to offer. Importance is given to the conservation, social and educational activities that take place in them, but, perhaps most relevant is the aesthetic and symbolic perception of saltscapes and salt heritage that exists in our culture as a result of a millennial-long relationship to this substance. The final pages of the chapter are devoted to reviewing manifestations around salt in art, music and literature. All along the text, numerous examples are provided, see Annex 3 for their location in the map.

7.2 The trilogy of salt

The sound recovery of salt heritage will largely depend on the local conditions and circumstances. However, most (former) salt making sites that have been or are in the process of being recovered in Europe, rely on the "trilogy of salt" (see Figure 7.1) to this end. As opposed to industrial salt making, in which the production of salt not only stays central, but is also the only activity taking place, in historical or traditional salinas, a combination of approaches is offered. Partly it responds to a need to diversify the economic activities, in order to minimise risk and maximise revenues. But also, it responds to a deeper meaning salt heritage has for people: Salt as an essential condiment; salt, brine and mother lay as sources of health and salinas as scenic landscapes of historical value. These apparently very different uses of salt are rooted in the collective memory of both local communities as the general public and recovered salinas are taking legitimate advantage of them.

These sites do not stand lose from their environment, either. They are where they are due to a unique combination of cultural and natural factors. The natural resource (i.e. salt) has of course to be present, but also other environmental features that allow the production of salt (soil, climate). The knowledge and tradition of salt making needs to be present on site, but its production must rely on the capacity of the hinterland to distribute and trade it. Hence, the natural and cultural context of a given site is also relevant and needs to be acknowledged as a part of the heritage recovery process. In this chapter, these axes of *action* and *context* of salt heritage will be analysed.

Figure 7.1: Trilogy of salt or main uses of a patrimonialized salina
(Source: Own elaboration)

"A salina is made for salt making". These are the wise or, perhaps, obvious words of Xavier Farré, artisanal salt maker in Gerri de la Sal, Spain. Salt making stays central to the recovery of salt-related heritage because of many reasons. The first, practical, beause it allows to maintain the facilities as they once were, without the need to upkeep them artificially. Secondly, because it's the most intuitive activity that can be developed in them. Resources and expertise will be easier to find for this purpose. With heritage dissemination and interpretation in mind, a living salina is also easier to show and to understand. The discourse around the site will thus flow naturally. Salt making, as an activity, allows the production of other related substances that may have economic value, whether as food, raw material for consumer goods or even biofuel. These are not only compatible with a sustainable approach, but even desirable, as they spread the risk of the negative outcomes of having a bad salt harvest and provide revenues form sub- and by-products that were not so long ago considered as waste.

Of course, the recovery of salt making as an activity is not always possible, given the ruined state of the facilities; the lack of expertise among local residents or simply a shift in priorities by managers and other decision makers. Some former solar evaporation salinas have been transformed into aquaculture farms, such as some in the Bay of Cádiz in Spain, or bird sanctuaries, such as the Marais de Séné in France. Others have been refurbished as private homes, such as the tiny salinas of Santamera in Guadalajara or Tragacete, in Cuenca, both in Spain. In Britain and Germany, former salt mines are being offered as safe storage sites[119] for delicate documents and objets. These are examples of architectural recovery, at the most. The site becomes a "packaging" for a new use, in which heritage plays not much more than a functional or aesthetic role. Although they have been conditioned for the reutilization of the premises, these cases cannot be considered as patrimonialized. On the other hand, despite not producing salt, many sites have been capable of attaining a certain degree of patrimonialization and to offer products and services that bear close links to their salt heritage and tradition, by simply accepting the state of ruin or decay, which can be simply consolidated. Examples of all these will be provided below.

[119] Salt mines are very stable physical environments, with little risk of geological movements, constant air temperature and low ambient humidity. The salt also prevents animals and fungi from causing harm to the objects in storage.

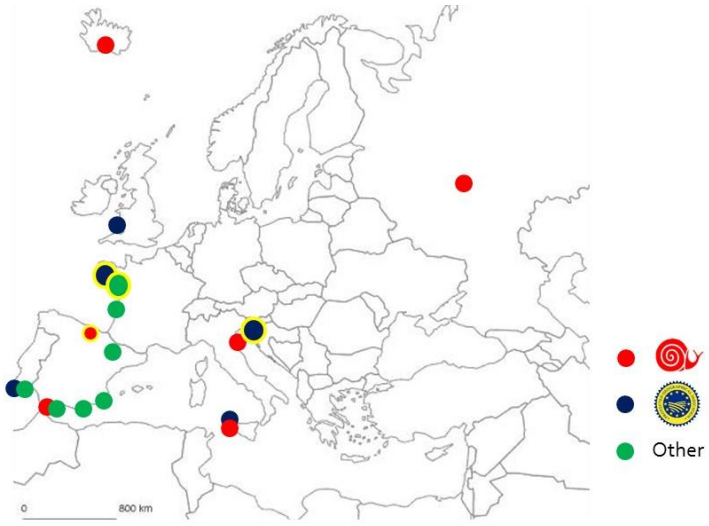


Figure 7.2: Food and gastronomic seals for salt in Europe (study sites with yellow rings) (Source: Own elaboration)

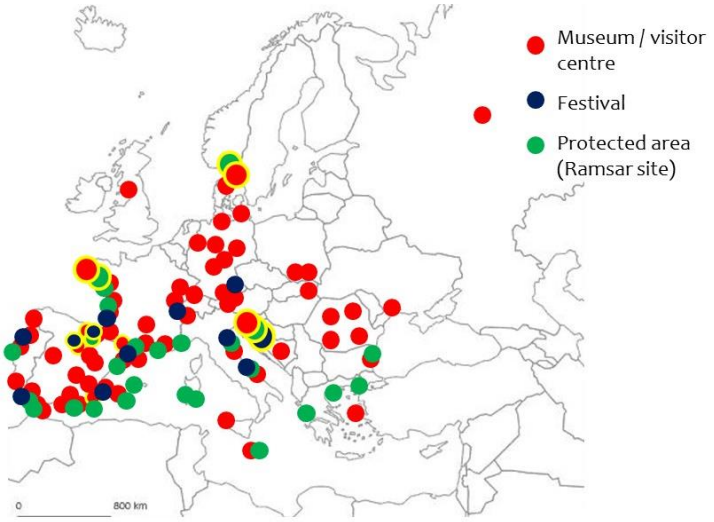


Figure 7.3: Ecocultural tourism around salt in Europe (study sites with yellow rings) (Source: Own elaboration)

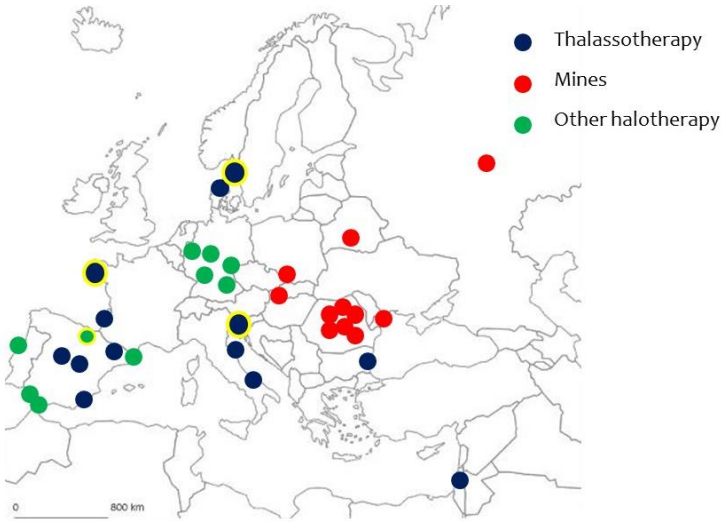


Figure 7.4: Salt-related health and wellness facilities in salt maing sites in Europe (study sites with yellow rings) (Source: Own elaboration)

7.3 Axis 1: Salt making, food and gastronomy

7.3.1 A sustainable salt making model

Few or no academic models have been proposed on the sustainability of salt making, from the point of view of the salt itself. Here follows an attempt: Figure 7.5 shows the ideal combination of salt types according different criteria: production methods (upper box in the center), scale of production (middle box) and final use (lower box) in order to achieve the goals of sustainable local development around salt making (see also Chapter 2).

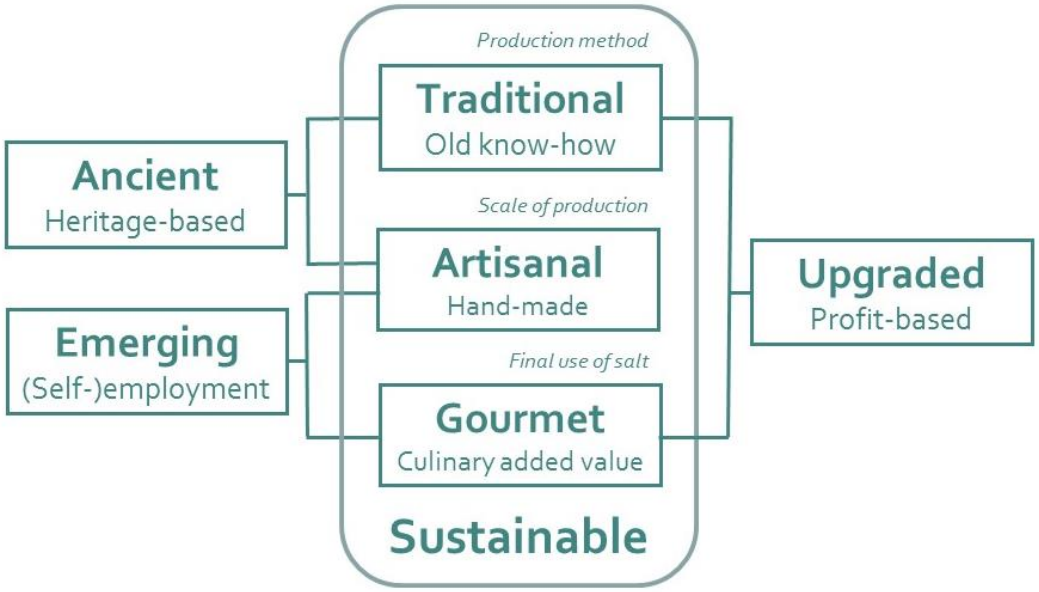


Figure 7.5: Multicriteria model of sustainable salt making
(Source: Own elaboration)

A traditional salt should be prepared according to techniques that have been in use before the advent of industrialisation, by using processes that have been active for perhaps centuries. Examples are open air solar evaporation, seething, selnering, etc[120]. Some of these techniques may, of course, have been transformed into industrial-scale processes, such as mechanised solar evaporation or seething in large pans.

Artisanal salts, on the other hand, are those that have been produced by hand, that is, without the use of automated processes or (heavy) machinery. Examples are hand-harvested solar evaporation salts, small-scale seething facilities, collection of salt deposited spontaneously in hollowed-out cliffs or lakeshores, etc. Even salts mined by hand, with pick and shovel, could be included in this category. A key feature of artisanal salt making is that the salt masters and labourers are in command of the whole process and more or less directly receiving the profit of it, by keeping short supply chains.

It is worth the effort to reflect upon the relevance of the supply chain in this context (see Table 7.1). A short supply chain will increase the profit for the salt maker and give the opportunity to have direct contact with the customers, who in turn learn to appreciate the

[120] For more detailed explanations of these techniques and categories, please consult Chapter 3 and Table 3.2

effort and professional know how of the salt master, constituting a win-win situation for heritage on the long run. The sale of salt takes place either face-to-face, al the salt making site; in a nearby shop or market stand, a.k.a. proximity; or it can be ordered via the internet, that is, in a so-called extended format. Ocassionally, the salt is sold in the informal circuit, that is, without necessarily following all the regulations on food production, packaging and storage. These methods avoid a lengthy list of intermediaries, who of course would need their share of profit along the way. The salt maker has the opportunity to explain a story, to give details on the process, to provide a narrative. Hence, in a short supply chain, the winners are both ends of the chain, whereas in conventional, long supply chains, the salt makers obtain very low profit and the customer does not confere an added value to the product, aside from its physical appearance or direct culinary uses.

Table 7.1: Differences between the typical supply chains of industrial and artisanal salts

Feature	Industrial scale	Artisanal scale
Type of supply chain	Conventional (producer – processor – wholesaler – retailer)	Informal Short (no/few intermediaries)
Distance to consumer	Irrelevant	Face to face Proximity Extended
Added value of the salt	Low to High	Medium to High

Source: Own elaboration

Back to Figure 7.5, on the other hand, gourmet salts are those that have been designed for their use for culinary purposes, more specifically as *finishing* salts (i.e. to be added once the plate has been served; Beltran 2008a, Hueso 2013, 2015c). In this case, the production technique or scale is irrelevant, whether it is industrial, traditional or artisanal, because their importance lies in how they can be used in gastronomic terms. The size and shape of grain (e.g. *fleur de sel*, flakes, coarse), the combination with herbs or spices, the colour (e.g. *sel gris*, pink salt, red alaéa from Hawaii) or even the odour (e.g. salt from Aveiro, smelling of violets; smoked salts; *kala-namak* from India, smelling of rotten eggs), are the relevant features. Pairings with food items (meat, fish, vegetables), whether from the taste or aesthetic point of view, become the reasons to choose one or the other.

This classification would be rather useless if it ended here, but the relevance of a certain salt with respect to the local development at its site of production, that is, its sustainability, is a key feature. The different combinations of the three basic salt types provide an insight in the relation of the salt with its hinterland. To illustrate this, each one of the three categories described above, as such, does not have much influence on local development. Traditional salt is a very heterogeneous group and does not offer any guarantee as to the final quality and use of the product. Especially if we consider industrial salts a variety or a outsized version of traditional salt. Also, the production process does not assure that the profit will be collected on site, as it can be swallowed by intermediaries of long supply chains. This is the case with traditional salt making sites which offer their salt in bulk to be processed by third parties, for instance. On the other hand, obtaining salt at an artisanal scale by itself does not guarantee enough sales if the product is not well presented. It is the scale of the process that makes it a fragile socio-economic activity. Small artisanal salinas have a high cost-benefit ratio, beause of the manpower needed and the low prices of salt in the regular market. Gourmet salts may be the most profitable from an economic point of view, as may be sold

for a price than can be dozens of times that of bulk salt[121], but these do not necessarily bear any relation to the site of production. Many gourmet salts are in fact prepared with industrial salt, bought by a distributor who makes the blend in its own premises. In Spain, this will continue to happen as long as there is no legal obligation to state the origin of the salt in the label, but only the location of the handling site[122].

Hence, we will be approaching sustainability if a combination of these salt categories is achieved (Figure 7.5). For example, traditional and artisanal salt making combined in a so-called "ancient" salt making process, will ensure the authenticity of the old professional know-how of salt making. It also allows to pass this knowledge on to current and even future generations, thereby contributing to preserve the cultural and natural heritage of a historical salt making site. But this model, however, does not guarantee economic sustainability. This is a typical situation in salinas that have been recovered as static heritage projects and cannot survive without a continued support of public funds or private sponsors. On the other hand, artisanal salt making processes that produce gourmet salts allow to raise enough profit to stimulate entrepreneurship and create jobs, in a combination defined here as "emerging salts". These salts typically have short supply chains, with a short distance to the final customer. While this approach is positive from the social point of view, it does not necessarily mean that it supports the preservation of cultural or environmental assets of a salt making site. This is the case of newly created artisanal-scale projects, especially common in northern latitudes or in wetter climates, where salt production simply did not exist in the past. Since many of these facilites are located in modern industrial buildings, there is hardly a link to salt-related heritage or to the natural and cultural context of the site. Another possible combination, is the use of traditional techniques to obtain gourmet salts. This type of salt making, defined here as "upgraded", dramatically raises the profit of salt as it has been transfomed from a conventional type, with a limited market value, to gourmet, with the perceived added value it entails. If the traditional technique has been transformed into a semi-industrial or full industrial activity, the gourmet salts will find a smooth path towards their final customers, thanks to a consolidated distribution chain. This is usually a long one, involving many different actors (producer, processor, wholesaler, retailer; see Table 7.1) before reaching the final customer, and the profit is then lost on the road. In addition, this model of salt making does not necessarily ensure the preservation of heritage assets.

Ideally, a balanced combination of the three salt making models should be found: An artisanal process using traditional know-how and providing the added value of a high-end culinary product. This would ensure the preservation of cultural and natural heritage (by using small scale techniques with old know-how), allow profitability (by selling a high quality product) and this profit, due to the scale and the short supply chain, will stay withing the community. This is the case of the most representative study sites seleted in this work: Guérande (France), Læsø (Denmark), Sečovlje (Slovenia) and Añana (Spain). It is also the model aimed at by some of the other study sites in Spain already producing salt: Poza de la Sal, San Juan, Rambla Salada and Gerri de la Sal, although yet far from being consolidated.

[121] A quick survey in a suburban supermarket shows that 1 kg of industrial fine salt was sold at 0.39 Euro, whereas 250 g of Maldon salt costed 4.65 Euro, almost 50x as expensive [Supermarket *Gigante* in Moralzarzal, Madrid province, 14 July 2015]

[122] During a visit to the 2014 edition of the *Feria del Gourmet* in Madrid, an exhibitor literally said "the salt is the least important issue here; what matters is the packaging", when asked about the origin of the salt he was selling, packed in hype methacrylate mills.

7.3.2 The uprising of salt as a food item

Traditionally, the salt industry offers a classification of salts that depends mainly on the humidity and grain size, which in turn is related to the final use of the product. Wet salts range from 0,1 to 1 mm in grain diametre and are typically used for pickles, food preservation and other, non-food uses. Dry salts, on the other hand, range from 0,1 to 6 mm in diametre, although only those finer than 1 mm are used as kitchen salt. There are of course other products sold in different formats such as blocks, to be used as licks for cattle, for example[123]. However, in popular language, two main types of kitchen and table size exist: coarse and fine, respectively[124]. Some people prefer using marine salt, under the assumption that it will be healthier, probably ignoring that all edible salts actually have a marine origin (whether past or present). Although each manufacturer will offer variations on these basic types, those are commonly used in most households.

On the other hand, an ever increasing interest of the public in food is creating a large diversity of superspecialised food items that stem from more generic categories. This diversity was traditionally well known for items such as wine or cheese, but it is now becoming common for other food categories: Meat, bread, olive oil, chocolate… and even water (Wilk 2006). The public has acquired a knowledge of the differences between one variety of food or the other, with varying degrees of depth and under more or less influence of opinion leaders and fashion builders. The choice of food is, therefore, not only a matter of quality, nutritional value or even safety, but also a result of the refinement of taste (Lozano 2008). This process from a general category to a myriad of specific varieties has recently started with salt. The irruption of some so called gourmet salts in the market, notably Maldon salt, the pink Himalaya salt and the *sel gris* from France (see below), worked as an eye-opener for many. These were initially sold in selected shops and can now be found at almost any outlet. In spite of this, the backgound knowledge of the salt (origin, production technique, heritage value…) is more than patchy: most salt comsumers do not show an interest in salt from those points of view, but are rather attracted to "coloured salts" as a rarity[125] (Figure 7.6).

Althogh it is difficult to assess how many gourmet salts are in the market, some authors have inventoried more that 150 varieties (Bitterman 2010), a figure probably well below the reality, given the evergrowing popularity of salt, the continuous creation of new salt making facilities worldwide, the many varieties each of them provide and the limited availability they have. Given this variety, different attempts have been made to classify these salts (see the "taxonomy of salt" offered by Bitterman, 2010). Some salt types are based on the shape or some other visible feature of the crystal, which have become generic names, such as flakes or *fleur de sel*. Pink salt, for instance, originally came from Pakistan –the famous *Himalaya*

[123] Detailed tables with the different sizes and uses of industrial salts can be found at the website of Instituto de la Sal, URL: http://institutodelasal.com/sobre_la_sal/variedades [Retrieved August 2016]

[124] Another common type of table salt in the US is *kosher* salt, which most often means it can be used to prepare meat according to kosher standards. It is a coarse-like salt that has not been iodized. In some cases, salt can also be certified as being kosher, although most salts comply, by nature, with this requirement.

[125] Jeroen van Wieren, owner of *Salsamentum,* a delicatessen shop specialised in salt located in Amsterdam, indicated that he had difficulty selling plain white salt, regardless of its quality or relation to its heritage values. His customers wanted salts with a visible twist in colour, texture, shape or even just packaging. Less interesting for his customers was the "sustainability" of the salt; where it came from, how it was produced or how respectful it was for the environment or the livelihoods of the salt makers (Jeroen van Wieren, pers. comm., 2014). At IPAISAL's salt tasting events, many a scholar shows surprise at the differences in taste, despite knowing that most of them contain over 94% sodium chloride. Or, as a geologist derogatively put it, when referring to inland salts, "it's just all Triassic!"

pink salt– but similar ones are now being produced in the Andes (e.g. Maras in Peru), Australia (e.g. Murray river) or the Alps (e.g. Hallstatt in Austria). Other, more site-specific names are for instance *sel gris* (gray salt), produced in the French Atlantic marshes.

Figure 7.6: Gourmet salts can be found in many different shapes and colours (©Katia Hueso)

Others respond rather to the trade names provided by salt makers, such as *jomfrusalt* (virgin salt), used by the Læsø saltworks to describe the first harvest of a pan, or *fossil salt*, referring to the geological origin of the salt, as it is used by an inland solar evaporation manufacturer in Villena (Alicante, Spain). Alternative names are also provided, such as *sal de hielo* (ice salt, i.e. flakes) from San Vicente (Cádiz, Spain); *ámbares de sal* (salt ambers, referring to their pinkish colour) from a salt mine in Catalonia; *flocons* (i.e. flakes) or *pétalos de sal* (salt petals, i.e. *fleur de sel*) also from Villena, etc. In other cases, the brand name itself is used, due in this case to the uniqueness of its shape (e.g. Maldon salt, typically forming small hollow pyramids)[126]. Many other unconventional gourmet salts exist outside Europe, which may use high technology to obtain different shapes, densities or other physical features. Examples are the deep sea salts from Japan or the high pressure salt pellers or *pearls* from South Africa. When all these salts are manipulated with additional processes (e.g. smoking, roasting, colouring) or blended with other ingredients (herbs, spices, aromas), the combinations are endless.

Some of these salts, in order to distinguish themselves, use instead quality seals (see Chapter 4 for more details). Figure 7.2 offers an overwiew of salts that have obtained a seal with an external certification system, such as *Slow Food* or EU's Indication of Geographic Origin[127]. Other seals included in the table are the *Marca Parque Natural*, in Spain, or *Label Rouge*, in France, awarded to the salts from Guérande and Salies de Béarn. Artisanal salt makers also make an effort to distinguish their salt from others by providing many details in their packaging. An example of their thoroughness can be found in Figure 7.7:

[126] The manufacture of this type of salt is one of the industry's best kept secrets. It has often been tried to imitate, without much success. Another mystery yet to be solved is how a relatively small facility is capable of providing salt to even the smallest supermarket, at least in Spain. Given the decrease in the quality of the pyramids (pers. obs.), one starts to wonder where these really come from.

[127] It is worth noting that analytical techniques exist to distinguish the geographical origin of salts, a useful tool to prevent fraud in labelling salts, especially for those with GI certifications (Galvis-Sánchez *et al*. 2013).

Legend

1. Logo of the Cooperative, with a *paludier* (salt maker) as main character
2. Information about the (extra) content in magnessium
3. Transparent window to actually see the salt
4. *Nature et Progrès* label, a certification for an environmentally friendly process
5. Photograph of a contemporary *paludier* in action
6. Regional seal of geographic origin
7. Chemical composition of the salt
8. Map with an indication of the site of production
9. Name of the organisation of producers

Figure 7.7: Details of a package of grey salt from Guérande (Source: Own elaboration)

As mentioned before, some of these salts are hard to come by, for different reasons. They are most commonly sold on site or via the internet, with numerous specialised websites devoted to high quality salts[128], wich are often run by retailers who are not in contact with the producer but with a wholesaler. In many of them, the sense of pride in the production process or its hand-made quality is lost and only the culinary value is highlighted. Some of the best known culinary salts are sold in high-end supermarkets, but no distinction is made between them, nor does the staff know much about the production process, site of origin, etc. Very few physical shops have specifically specialised on salt, namely. The best known examples are the already cited *Salsamentum/De Zoutkamer*, in Amsterdam; *The Meadow*, in Portland, Oregon and *Oli I Sal*, in Barcelona[129]. Despite being all far from any (artisanal) salt production site, their owners are truly passionate about their stock and act as culinary advisers, cookbook authors and salt ambassadors. These phenomena are not alien to the study sites, which are producing different types of salt and combine the with herbs and spices, mainly. Table 7.2 shows an estimation of the average production of their salts and the types they produce.

The consolidated heritage recovery sites offer a broad range of products, with a variety of salts, blends and sub-products. They have a well-developed corporate image and a packaging design that not only complies with the food-packaging regulations but also offers an image of quality and identity. Those sites with a more testimonial production, tend to focus on a couple of salt qualities (regular and *fleur de sel*, normally). Not by chance, the latter have a less developed packaging design and their salt is normally sold in the informal circuit. As a token of hope for these sites, Salinas de Añana, now consolidated, was searching for its identity through packaging not so long ago[130].

[128] Examples are *Saltworks*, in the USA (URL: https://www.seasalt.com); *The Salt Cellar*, in Canada (URL: https://thesaltcellar.ca); *Gourmet Salt*, in the UK (URL: http://www.gourmetsalt.co.uk) or *Va de Sal*, in Spain (URL: http://www.vadesal.com) [Consulted in August 2016].

[129] Their websites are *Saltsamentum / De Zoutkamer* URL: http://www.salsamentum.nl/, *The Meadow* URL: http://themeadow.com and *Oli i Sal* URL: http://www.olisal.com [Consulted in August 2016]. Unfortunately, *Salsamentum/De Zoutkamer* had to shut down in the autumn of 2016.

[130] In my personal collection, I have at least three very different packages (in cloth, cardboard and glass, respectively) of salt from Añana, all with different typesetting and logos.

Table 7.2: Offer of salt and salt sub- and by-products in the active study sites

Site	Types of salt			Other products	Estimated production	
	Regular salt	Fleur de sel	Other salts		Salt (T)	Fleur de sel (T)
Spain						
Añana	x	x	Flakes Blended	Brine spray Bath salts	148	24
Poza	x	x			15-20	N/A
Rambla S.	x	x			Testimonial	
Gerri	x				Testimonial	
San Juan	x	x			150	N/A
Rest of Europe						
Guérande	x	x	Blended	Bath salts Wellness products Salted food	16,000	700
Læsø	x		Flakes[1]	Wellness products Salted food	70	0
Sečovlje	x	x	Iodised	Bath salts Wellness products	5,000	30

[1]Known as *jomfrusalt* or virgin salt (discontinued in 2015); N/A: data not available
Source: Own elaboration

7.3.3 Other salt-based food items

Other food items made with artisanal salt or based on salt-related products, which can be used as additional sources of income, are:

Garum

Garum is a generic name for a fish-based sauce originating from the Mediterranean region and widely used during the Antiquity. Its preparation has a certain air of mistery, and despite its recipe ("a maceration of fish intestines in salt", Grimal & Monod, 1952), it was greatly appreciated by the upper classes. Similar sauces existed in this period, whose name depended on the type, size and quality of the fish used. They were known in Rome as *garum*, *muria*, *hallec* and *liquamen*. Garum itself could also have subdivisions, depending on the type of fish and the additional ingredients that were included. Examples of the latter were *oenogarum* (with wine), *oleogarum* (oil), *hidrogarum* (water) or *oxygarum* (vinegar) (Lagóstena 2007). In the Antiquity, these sauces required large quantities of salt and dependend on the easy provision of this mineral. *Garum* factories were therefore located near salt making sites. Contemporary recipes can easily be found for the preparation of these sauces, which in fact are very similar to well known condiments such as soy sauce or *colatura.* Commercial modern *garum* sauces are slowly entering the gourmet market. However, despite the close relation between these sauces and salt, few if any salt making sites have sought synergies with *garum* manufacturers or, if they do, it is hard to be perceived by the consumer.

Salsamenta and other salted food items

Salsamenta was the Latin name for dried salty fish. By extension, I will refer here to other salty food such as meat or pickles. Although preserving food in salt is less widespread since the advent of refrigerators, still some pickles and cured foods are widely popular (sausages,

cheese, olives…) (e.g. Gallart *et al.* 2004). In some souvenir shops (e.g. *Terre de Sel* near Guérande) and specialised retailers (e.g. *Salsamentum* in Amsterdam), these items are sold alongside the (locally produced) salt. It is an excellent opportunity to create synergies with other food manufacturers and create a brand around local quality food. In certain salt making sites, it is becoming common practice to sell industrial food items spiced with artisanal salt. It is a win-win situation for both actors involved: The salt makers gain notoriety by having a broad distribution of the final product and the food items gain a reputation of being of higher quality. Examples are salted crisps, chocolates, ice cream, butter, buiscuits, sweets…

Salicornia

The genus *Salicornia*, a succulent plant typical from saline grounds, grows in the neighbourhood of most solar evaporation salt making sites. The species *S. europaea* was traditionally used to produce soda and is commonly known as glasswort, pickleweed or marsh samphire. Denominations vary depending on the location, but these names may also be used for other species. Since halfway the 19th century, it is commonly used as food whether fresh or pickled and today it is cultivated off the Atlantic salinas of France and Portugal, where it is also known as *sal verde* (green salt) (Chevalier 1922) (Figure 7.8). A company in Portugal, *Best Fish*, has a section specialised in the sale of *Salicordina* and other halophytes for culinary purposes, quite appropiately named *Horta Salgada* (salty garden). Other *Salicornia* species are known for their medicinal properties, typically in the Far East (Rhee *et al* 2009).

Figure 7.8: Glasswort preserved in pickle, with the label depicting a salina (©http://www.lafermesalicole.fr)

7.3.4 Non-food products related to salt

A number of non-food products can be obtained from solar evaporation salinas and similar salt making processes, without altering the activity of salt making itself. These are resources that can be used as an additional source of income and support and reduce waste.

Bittern / mother lay

Bittern, also known as mother lay, is the liquid remaining in the salt making ponds or pans after the sodium chloride has crystallised. Traditionally it was discharged as a waste product (Davis 1999). In some sites, the discharge could affect the ion composition of the surface

waters. This was the case in Imón, where the salt makers needed to warn local herders to prevent livestock to drink from the Salado river during some hours after a discharge. Elsewhere, the bittern was recovered from the crystalizers to obtain epsomite ($MgSO_4$, magnesium sulphate, a.k.a *Epsom salts*) or sylvite (KCl, potassium chloride). *Epsom salts* seem to have countless health benefits[131] (see also below) and numerous household and gardening applications. It also has industrial uses, for instance, as an aid in the biological treatment of wastewater (Lee *et al.* 2003). Sylvite, on the other hand, is typically used in the manufacture of fertilizers. Bittern is also used to obtain low sodium salt, a product that has gained certain popularity among patients with high blood pressure.

Salt blocks and other accessoires

The use of rectangular salt blocks as a cooking plate has become fashionable in the past few years. They are cut in different sizes, depending on the use to be given. Apparently, they "can cook, cure, cool, freeze, caramelize, brown, soften, firm, crisp and show off food" (Bitterman 2013; Figure 7.9). Most come from the pakistani Salt Range, south of the Himalayas, where the famous "Himalaya" salt also comes from, and consequently show different hues of pink and orange. Other inland salt making sites have started manufacturing them and there does not seem to be any reason why other salt-rich areas cannot follow suit. Besides from the salt blocks, many other utensils made of salt can be sold: jars, plates, lamps (see below), figures, cellars…

Figure 7.9: Salt block cooking
(©http://es.pinterest.com/ahmna85/salt-block-cooking/)

[131] It depends on the source consulted. The internet brims with the Epsom salts health benefits, but enough evidence exists, too, of the misuse of these salts.

Halophilic microorganisms

Halophilic microorganisms[132] have potential applications in biotechnology, as conductors for computing and electronics or in the production of polymers and enzymes, liposomes and other cosmetic applications. Another typical field of application is the biofuels industry, such as for microbially enhanced oil recovery, bioremediation and pollutant removal and manufacture of biofuels. The pharmaceutical industry also benefits from halophiles, among others, for the production of antibiotics, cancer detection and other drugs and for drug screening (DasSarma *et al.* 2010, Galinski & Louis 2002, Galinski & Tindall 1992, Kanekar *et al.* 2012, Margesin & Schinner 2001, Margheri *et al.* 1987, Oren 2002, 2010; Ventosa & Nieto 1995). *Dunialiella salina*, a microscopic algae rich in ß-carotene, is already widely used in the food industry as food supplement and colourant (Ben-Amotz & Avron 1989). Besides, halophiles – a specific category of extremophiles, i.e. organisms living in extreme environmental conditions– are a well known study object for those scientists interested in extraterrestrial life (Mancinelli 2005). The use of these microorganisms for research, innovation and even industry, is in principle compatible with a sustainable salt making process.

7.4 Axis 2: Eco-cultural tourism

As discussed in Chapter 2, tourism has traditionally been seen as a solution for territories in which primary productive activities are in decline, by preserving, showing and making (sound) use of natural and cultural heritage assets. Traditional and artisanal salt making sites are becoming sites of interest for visitors, as they constitute a different sight and a provide with a new experience from what conventional destinations have to offer. These sites are particularly well suited for ecocultural tourism, as they offer a unique and coherent combination of natural and cultural features and are intriguing enough to trigger the curiosity of visitors with a certain degree of eagerness to learn. In addition, they are in general quite accessible –flat or terraced terrain– and do not require special equipment or abilities to visit them.

7.4.1 The recovery of salt heritage for tourism

The full recovery of a productive activity is often costly, if not, inviable. The recovery of a salt making site in decline is a complex process and hardly one site goes through the same steps as the other (see Figure 5.9), making it difficult to learn from each other's experiences. For this reason, sites under recovery usually focus first on visitors, gradually moving on to the reactivation of its former activity, if feasible. The main advantage is that showing the productive activity itself or its remains to the public is acceptable and even possible at any scale or level of decay (see Table 3.2). In some cases, there is even a certain pride in keeping the industrial heritage as ruins, to preserve its authenticity and highlight the history of arduous labour and misery undergone by workers and their families (DeSilvey & Edensor 2013, Huyssen 2006). However, in the case of former salt making sites, few can be attractive for visitors when in a state of ruin, because of the brittle nature of the materials used (clay,

[132] Halophilic microorganisms are those microscopic species that thrive in saline waters. Solar evaporations salinas are rich in such organisms and the functioning of the salt making process actually depends on keeping an adequate balance of their populations (abundance, density). For further details, see Chapter 3.

wood, stone), usually obtained from the surrounding countryside. The salt making basins are shallow and prone to weathering, quickly blending again with the landscape. Sedimentation of clay and sand often covers the surface, preventing the sight of the technical finesses (e.g. carefully paved bottoms with stones or boulders; Hueso & Petanidou 2011a) needed to create a proper salt making surface. Hydraulic devices and infrastructures, perhaps the most valuable heritage asset of a former salt making site, are often the first victims of the stagnation of the activity. They often disappear soon after abandonment, whether taken away for recycling, stolen or even vandalised. Storage and administration buildings that can be found nearby, are built according to the common style in the area, not being too different from buildings used for other purposes. Hence, few ruined salt making sites have the power to attract visitors, if based solely on their architectural remains. This is, for instance, the case of Salinas Espartinas in Madrid, with its infrastructures hardly recognisable. Of course, such sites have a strong evocative power and the saline habitat is a powerful landscape, especially if salt crusts or saline water coloured by bacteria are visible, but these are features more difficult to appreciate by the general public. However, recently abandoned or inactive salinas are a whole different experience. The salt making complex is still visible and even understandable. One can easily imagine the hustle of the workers harvesting the salt, the storage buildings filled to the brim and the machinery still in operation. This is the case of some of the sites in Spain: Imón, Peralta and Arcos de las Salinas, although given the fast decay of such infrastructures, the impression is gradually becoming more of a ruined landscape.

In other cases, the site is reconverted for a purpose that is different than the original one, a very common situation in industrial heritage located in inner cities[133] or which does not longer comply with the regulations or standards that apply to that activity in particular. In the case of former salt making sites, numerous examples exist of new uses. Some are still somewhat related to the resources found on site, such as the Salinar de Naval in Huesca, where salt baths are offered to the public. Occasionally salt is being produced, but at a very small scale. Others have been transformed into private homes, such as the already mentioned Salinas de Tragacete, in Cuenca or Salinas de Santamera, in Guadalajara. In coastal sites, some salinas have been transformed into aquaculture farms, such as Nuestra Señora de los Desamparados in the Bay of Cádiz or Salinas del Astur in Punta Umbría (Huelva). An interesting case in the Portuguese company *Necton*, located in the Natural Park of Ria Formosa, Algarve, which combines the production of artisanal salt with the culture of microalgae for cosmetics and aquaculture. This company, which started in 1997, already has three spin-outs devoted to the production of biofuels from microalgae, the culture of bivalves and the manufacture of natural cosmetics. In the French Atlantic salt marshes, some former salt making units are being kept intentionally inactive, for nature protection. In these latter cases, visitors are not encouraged or even admitted.

Yet in other cases, efforts are made to recover the site up to a certain degree of functionality or even full operability. Salinas are one of the few productive sites that can be recovered to their primitive state and be fully operational again[134]. If this is feasible from a technical and financial point of view, it would be the most obvious choice. Salt making becomes the main

[133] See for instance the change of use in former industrial facilities in downtown Madrid, which are now protected as heritage but have been reused for a different purpose (Hidalgo & Palacios 2016)

[134] This is quite an extraordinary fact. Few other productive activities can be recovered as they were performed in the past. Examples may be communal ovens, lime kilns, forges or other small scale, generally rural, activities. Certainly, no other traditional mining or industrial techniques would comply with current regulations. This argument further supports the idea that artisanal salt making is more akin to agriculture, rather to an industrial or mining activity.

activity, following the historical narrative of the place, and therefore the chief attraction for visitors. In some cases, the production of salt is considered the main purpose of the site, tourism being a complementary activity. This is the situation of the salinas of San Juan, in Guadalajara, which has an agreement with the local government to sell salt for winter road maintenance and are only now considering to sell food grade salt to visitors. Visitor facilities there are virtually lacking. In other cases, salt making is performed rather than done, that is, salt is made for demonstration purposes and visitors are the protagonists of the site. This is by far the most common situation among the study sites, such as Poza de la Sal, Gerri de la Sal or Rambla Salada. The salt that is being produced during these performances is sold to visitors on site and hard or impossible to come by elsewhere. In Poza de la Sal, salt production increases because the association in charge of the site, has established a system of turns for local residents, to obtain their own salt. Part has to be donated to the association and the rest can be taken home. In Rambla Salada, a great portion of the production is also obtained by volunteers during summer activities.

Only in consolidated recovery projects, salt production and tourism thrive on equal terms with respect to revenue and employment. Although the two activities may be managed independently, there is a strong interdependence among them. This is the case of Añana, Guérande, Læsø and Sečovlje. Their success lies in the maintenance of a delicate balance between the needs of salt makers -to obtain the best possible salt- and visitors -who want the best possible experience. Often these needs may clash and a certain dose of diplomacy, awareness raising and mutual respect has to be provided to both interest groups. This is of course easier if the double edged recovery project has been planned from scratch (i.e. from a situation of abandonment).

Very seldom it happens that an active salt making site downshifts its scale from *proto-industrial*[135] to artisanal, while incorporating tourism among its activities. This is the case of Salinas de Oro, in Navarra, or Salinas Biomaris, in Huelva. A part of the industrial saltworks in Mallorca, Salines d'Es Trenc, has been sublet to a third party for the production of hand-harvested *fleur de sel*, which also invites visitors to witness the process. Other industrial saltworks have started "manufacturing" it in their own facilities (examples are Camargue in France, Ses Salines in Mallorca or Delta del Ebro in Spain). Some artisanal salt masters speculate that these companies use mechanised systems to collect their so called *fleur de sel*, an impossible feat given the delicacy of the true *fleur de sel* crystals. In these cases, visitors are not particularly welcome in the productive areas, but are rather invited to enjoy nature in the large brine concentrating basins, where no visible activity takes place.

7.4.2 Tourism activities

Guided visits

Offering visits to a salt making site is probably the activity with which all recovery projects start. After all, it can be done without any need of investment. An informal stroll through a ruined landscape can already be considered some form of "ecocultural tourism" and in the case of satscapes, can be done unsupervised. In many abandoned salt making sites, this is common among spontaneous visitors arriving by chance or with little preparation to the site.

[135] These are salinas that sold their salt in the conventional market and were partially mechanised. Given the low profitability of their activity, at some point they needed to decide whether to upgrade to full "industrial" scale -rather difficult, due to the small size of the sites and their subsequently modest production figures- or shift to artisanal scale, focusing on a different market.

Also specialists, interested in specific aspects of the site (architecture, flora, engineering…), often visit these sites by themselves or in small groups. In all these cases, neither the local community nor the managers of the site benefit from these visits, which may constitute a missed chance to obtain revenues[136]. In most study sites, such as Salinas de Añana, Poza de la Sal, Gerri de la Sal, Peralta de la Sal, Imón, San Juan or Rambla Salada, information panels exist, offering a succint version of the history of the site and the salt making technique practised there. This is often the first contact visitors have with an explanation of the values of the site, but it is often also the only one. It is also striking to observe how these information panels and even more specialised publications, miss the chance to explain the regional or national relevance of salt heritage and saltscapes as fully fledged cultural landscapes, indirectly giving the impression that no other salt making sites exist.

Well organised, guided visits can also provide revenues from a very basic level. They are a simple yet effective way to offer knowledge and experience to the public. Guides with an adequate training in heritage interpretation and capable of showing empathy with the visitor's needs and interests can make a significant difference, as they "translate" the unknown landscape elements into a relevant learning experience (Figure 7.10). Guides can also present heritage from different angles, adapted to the level of prior konwledge or specific interest of the visitor, giving thus an added value to the visit. In other cases, visits are guided by former salt workers. They may miss specific training as guides or give a biased view of the site, but offer a unique personal insight with abundant technical and vernacular know-how.

Figure 7.10: Group of visitors in Salinas de Añana, listening to their guide (©Jan Pieter de Krijger)

This type of visits requires an investment in human resources and their training, but are perhaps the most basic level of tourism services that may be on offer. Although most of the guided visits are done on foot (e.g. such is the case in the sites of Salinas de Añana, Poza de la Sal, Gerri de la Sal, Rambla Salada, Guérande, Læsø…), an additional degree of sophistication may be included, if the visits are offered aboard vehicles (buses, mini-trains, boats…). This is the case of other salt heritage sites, such as the salt mine in Cardona, in which visitors are shuttled from the visitor centre to the mine on a mini-train; or the salines de Camargue in France, where boat tours and even rides on horseback can be booked. In

[136] According to calculations made by the Association of Friends of Inland Salinas in 2003, the salinas of Imón were visited spontaneously by an estimated 5,000 persons per year, without having been offered any kind of information or additional incentive.

Salinas de Añana, a private company offers different tours on *SegWay*. Few sites, however, have adapted their guided tours for visitors with special needs, although the Fundación Valle Salado in Salinas de Añana is one of the few that does offer them.

It has been shown that visitors tend to prefer salt making sites that offer an experience, rather than simply a static view of the built heritage, as they provide them with "a narrative of culture and heritage" of their own, and create an emotional link to the site (Che 2011, Wu *et al.* 2015). As discussed above, salinas with a consolidated recovery project try to combine their regular salt making activity with visits on site. There is a need to regulate the flow of visitors, so that it does not interfere with the salt making activity. Guérande, for instance, invites visitors to follow a guided visit in a controlled section of the site, whereas Añana has a guided tours-only scheme and access to the valley is otherwise not possible. Ocassionally, special events events are organised in operational sites (see also below), so that the visit combines the salt making activity with an additional incentive. Examples are the night-time visits in Læsø to witness salt making under candle light; dramatised visits in historical sites such as Salinas de Añana or Rio Maior, in Portugal; salt tastings on the spot in Guérande, etc. Sites under recovery may organise salt making demonstrations during certain periods, such as open days, salt fairs, public holidays, etc. In certain cases, the public is invited to make their own salt, which they may take home, such as Læsø, or Naval and Salinas de Oro, in Spain. This practice, however, is seen elsewhere as disrespectful towards the century-old professional know-how of salt makers, as it happens in Guérande.

Salt museums, a consolidated form of salt tourism

At a different level of complexity, built facilities to welcome visitors may range from a basic reception centre to a full sized museum. The term "museum" can be elusive, seen the broad use it is given (see also Chapter 5). However, there seems to be a clear consensus among scholars that a museum is "a permanent institution [...] which acquires, conserves, researches, communicates and exhibits [...] heritage"[137]. Within the context of salt heritage, only two museums in Europe comply with this definition, namely the Musée des Marais Salants in Batz-sur-Mer (Figure 7.11) and the Deutsches Salzmuseum in Lüneburg (Petanidou & Hueso, unpublished data). However, 88 salt heritage-related facilities have been identified in the continent as being akin to musea, such as a private collections, visitor or interpretation centres, ecomuseums, or theme parks (Hueso & Petanidou 2011b, see also Figure 7.3). For the purpose of this text, I will refer to all of them as "museums", despite their obvious differences and shortcomings.

Museums are also a well tested form of heritage dissemination, as they are cheaper to build and maintain that the full recovery project of a given productive site. In the case of salinas, these facilities are associated to natural protected areas, whether coastal solar evaporation sites or inland saline lakes. This is the situation of saline wetlands belonging to the Ramsar network (see Chapter 4), but also of many regional and natural parks. Table 7.3 shows the

[137] This abridged version of the definition of museum established in the statutes of the International Council of Museums (ICOM), last reviewed in its 22nd General Assembly in 2007, almost completely coincides with the definition provided by the Spanish Act on Historic Heritage (*Ley 16/1985 de Patrimonio Histórico Español*). The French law on museums (*LOI n° 2002-5 du 4 janvier 2002 relative aux musées de France*) has a similar spirit, although somewhat lighter definition: A museum is "any permanent collection comprising property the preservation and conservation of which benefits public interest and which is organised for purposes of knowledge, education and public enjoyment". See also Chapter 3 for a discussion on this issue.

protected status of the study sites, and Table 7.4 specifies the facilities associated to each of the study sites. As it can easily be seen, the protection status seems to be irrelevant in the performance of the site, or its investment in tourism.

Figure 7.11: Musée des Marais Salants in Batz-sur-Mer, one of the few true museums on salt in Europe (©Katia Hueso)

Table 7.3: Protection status according to different criteria of the different study sites

Site	Score	Culture-based			Nature-based			
		ERIH	World Heritage	Monu-ment[1]	Ramsar	Natura 2000	GeoParks	Other natural prot. area[2]
Spain								
Añana	90	X	(X)	X	X	X		
Poza	67			X				
Rambla S.	64			X		X		X
Gerri	55	X		X			X	
San Juan	54			X		X		X
Imón[1]	46			X		X		X
Peralta	40			X				
Arcos[1]	30			X				
Espartinas[1]	22			X		X		X
Rest of Europe								
Guérande	93		(X)		X	X		X
Sečovlje	91	X	(X)	X	X	X		X
Læsø	75	X	(X)		X	X		(X)

Between brackets, intended to be declared

[1]According to national legislation, [2]Any category of natural protected site declared by national legislation (e.g. national, natural or regional park, microrreserve, etc.)

Source: Own elaboration

The purpose of these premises is not so much presenting a collection, but rather offering an overview of the natural and cultural values of the site, including elements of intangible heritage, having an appearance similar to ecomuseums. In other cases, the museums are related to former salt mines and seething facilities. Occasionally they are located off site, but in the nearst town (e.g. the Salt Museum in Northwich, UK), with which salt has a strong historical relevance, via its storage, trade or distribution.

Some others constitute a subdivision of a combined set of themes of interest, such as maritime issues at the *Museo del Mar y de la Sal*, Torrevieja; anchovies fishing at the *Museu de l'Anxova i la Sal*, L'Escala; wine at the yet to be opened *Museo del Vino y de la Sal*, Chiclana, all in Spain (Hueso & Petanidou, unpublished data).

Salt museums are a relatively recent phenomenon. Most of them (77 out of 88) were created in the second half of the 20th century, coinciding with the explosion of technical museums and ecomuseums (cf. Alonso Fernández 2006, Benčič & Žagar 2002b). There are exceptions, however: the Salt Museum in Northwich (UK) and the *Museu de la Sal "Josep Arnau"* in Cardona (Spain), are over one century old; and the three salt mines in Austria (Altaussee, Hallein and Hallstatt) were open to health-seeking visitors already in the Middle Ages, while the other Austrian museum (Hall in Tirol) was created around 1850 (Hueso & Petanidou, unpublished data). One particular type of museum that lends itself well for showing a former productive site is the combination of (one or several) traditional exhibit(-s) with live demonstrations of the activity. In coastal salinas, these facilities are very close to the idea of ecomuseum, with a strong emphasis on natural values (e.g. Ecomusée du Marais Salants in île de Ré, France). In former industrial sites, the model responds more to a heritage park (e. g. Parc Cultural de la Muntanya de Sal in Cardona, Spain). This idea is gaining momentum in other cultural landscapes, having been implemented in Cheshire (Lion Salt Works, Lageard & Drew 2015) and having been proposed for Arcos de las Salinas (Iranzo & Albir 2009).

Visitor numbers to salt museums vary largely and are difficult to gather, given the different standards measuring them. The annual number of visitors to the salt museums ranges from 1,000 (Salt Museum in Pomorie, Bulgaria, created in 2002 within the frame of the project ALAS; Petanidou *et al.* 2002), to 180,000 (*Saline Royale* in Arc-et-Senans, France) or 350,000 at *Salzwelten*, the combined salt mines of Altaussee, Hallein and Hallstatt in Austria, or even 1,200,000 at the salt mine and museum in Wielizcka (Theodora Petanidou, University of the Aegean, pers. comm.). Not by chance, these three are protected as World Heritage (see Chapter 4). These museums are much larger in size as all others and are considered monuments by themselves, regardless of the salt making they relate to (Wirth 2001).

With these visitor figures in mind, museums constitute an opportunity for local development, albeit modest. In a study by Nasiadis (2004), 24 salt museums were surveyed on different management issues. Regarding human resources, half of them informed that they employed less than five permanent staff members, whereas five of them employed more than ten. Three quarters of the museums that responded relied on seasonal staff for the high season, with 14 of them hiring less than 10 seasonal employees per year. In the same study, funding relied mainly on admission fees and public subsidies, while less important sources of revenues were retail sales and donations. The main challenge for the museums located in the study sites, is, precisely, funding. In the Spanish study sites, public subsidies have dwindled considerably since 2008 and visitor numbers are yet too low to support the facilities and the staff. In the European cases, funding mainly relies on the expenditures of visitors.

Synergies with other assets and services

Visitors are considered a welcome customer, as they tend to be more willing to pay for products and services when they are in a personal context of leisure and relaxation, plus they tend to stay in the area and use associated services such as restaurants or hotels, spreading the profit among the community. This is the main reason salt tourism initiatives tend to combine ecocultural experiences, such as visits to museums or heritage assests, with leisure

activities such as shopping or sports. In some cases, visitors combine business or other compulsory activities, such as meetings, training or therapy, with leisure. Salt museums and other former salt making facilities can easily lend themselves as multifunctional venues. Storage buidings have been converted into auditoria, such as the Santa Ana storage buiding in Añana or a similar one in the Salina Ettore e Imfersa in Marsala, Sicily. Salt museums can be also be used for all kinds of events (exhibits, talks…). As an example, the *Zoutmuseum in Delden*, The Netherlands, is officially authorised to be used for weddings, since it is owned by the municipality (Ineke Kersing-Blok, curator, pers. comm.).

Some of the salt museums, especially those associated to mines, combine their cultural offer with balneo- or halotherapy (see below). Patients can take advantage of prolonged treatments (from a few hours to a few days) with a visit to the industrial heritage or the museum, as is the case in Bochnia, in Poland or Târgu Ocna and Slanic Prahova in Romania (Unguraș *et al.* 2009, Wiewiórka *et al.* 2009). Other salt making facilities, such as graduation towers (e.g. Ciechocinek in Poland), open pan seething sites (e.g. Salies de Béarn in France, Læsø) or solar evaporation salinas (e.g. Añana or Sečovlje) combine these functions.

An additional source of income is the sale of books, postcards, souvenirs and other salt-related paraphernalia (e.g. samples of minerals, shakers, cellars). In some museums or shops, great importance is given to salt itself and other food items spiced with local salt. The latter is more common in artisanal salt making sites, in which a certain pride on the product is perceived. Local salt –or even recipes with salt– can also be offered in restaurants. During the yearly salt fair in Aveiro (see below), local restaurants that uses local artisanal salt for cooking can be identified with a sticker on the door.

Events

Another popular form of dissemination of salt heritage is the celebration of festivals, fairs, markets or events related to salt, usually on an annual basis (see Figure 7.3). This can attract thousands of visitors over a few days, significantly increasing the number of yearly visitors to the site and concentrating the revenues over a short period of time. The celebration of events may have salt as a central theme, such as the already mentioned *Feira do Sal* in Aveiro, in Portugal; *Heste de la Saü* in Salies de Béarn, in France, or *Sapore di Sale* in Cervia, in Italy. In other cases, the event combines it with other local heritage values, such as the *Festa de la Sal* in L'Escala, Girona, in Spain, in which salt shares the attention with anchovies, the main culinary product of the town. In Cardona, Barcelona, the *Feria Medieval – Fiesta de la Sal*, combines the mediaeval heritage of the town with its strong link to salt mining. The *Feria del Carmen y de la Sal* in Cádiz (see also below), has the commemoration of the festivity of the *Virgen del Carmen* as a central theme. Except for the latter case, the choice of the date of celebration, usually in the summer months, does not seem to respond to any particular tradition but rather to the convenience of attracting more public during the summer vacation or at least in the warmer periods, to ensure stable weather conditions.

In other cases, specific events in the salt making calendar are celebrated with the local community and the visiting public. Añana commemorates both the start of the salt making season as the *Fiesta del Entroje*, or the storage feast, which is when the harvested salt is being stored for the winter sales, usually in October.

In most cases, however, the events seem to be the excuse to organise activities that are similar everywhere: Contests, races[138], exhibits, demonstrations, shows, concerts, talks, markts, popular meals, activities for children or the elderly… Some of them will have direct relation to salt, others will not. There are also events that are not specifically related to salt, but use the saltscape as a pituresque venue to celebrate it. This is the case of the half-marathon celebrated in Salinas de Añana since 2014 (Figure 7.12), with a participation of over 300 runners. Other sites try to profile themselves with original ideas, such as the yearly salt Nativity scene contest in the inland site of Rio Maior, in Portugal.

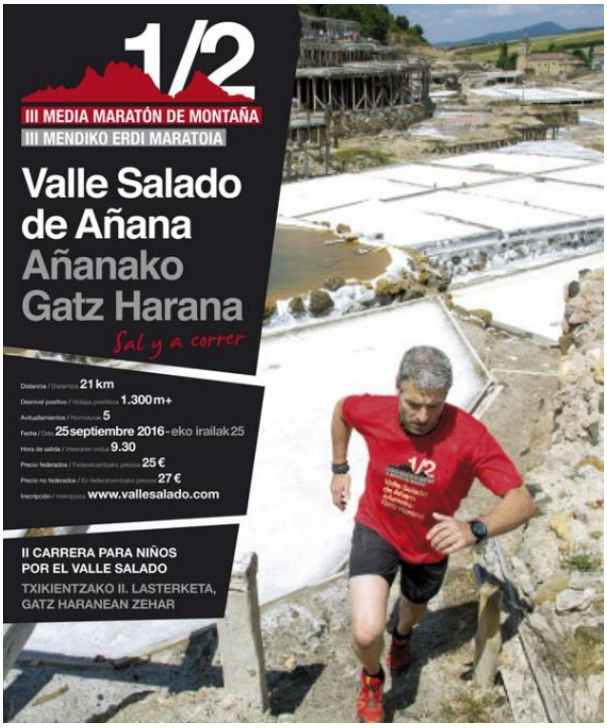


Figure 7.12: Poster announcing the half-marathon in Salinas de Añana (©Fundación Valle Salado)

Table 7.4 summarises the facilities for visitors discussed above, as offered in the different study sites. Guided visits may vary from year to year, according to the demand of the public. The table distinguishes "info/reception centre" from "museum-like facilities", the first being a place where visitors may obtain practical information for their visits, use the toilets and buy souvenirs or salt; whereas in the second, at least an exhibit on the values of the site is offered. An estimated number of visitors to the site is provided, too.

Consolidated and active sites have a clear strategy towards the attraction of visitors, being conscious of their dependence of their expenditures. Only the sites still under recovery have less developed facilities, such as guided tours (e.g. San Juan or Peralta). Læsø stands out as not having a museum, as compared to the other two European sites, the reasons for which have been explained in Chapter 6.

[138] The exception to this may be the case of Salies de Béarn. This inland salt making site in southern France is the permanent and sole venue of the "World Championship" of brine bearers. Men run in pairs, carrying 130 kg of brine in a cask and women run with a wooden bucket on their heads, carrying around 20 kg of brine. The clue is to run as fast as possible and avoid spilling the brine during the race.

Table 7.4: Tourism facilities and activities in the study sites

Site	Score	Estimated nr visitors	Information panels	Guided visits	Visitor centre(-s)	Museum[2]	Salt-related events
Spain							
Añana	90	64,000	Self-guided route	Year-round	1		3x/year
Poza	67	10,000	Informative	Year-round	1	1	1x/year
Rambla S.	64	1,500	Informative	Weekends		1	1x/year
Gerri	55	2,000	Informative	Year-round	1	1	
San Juan	54	N/A	Self-guided route	Summer			
Imón[1]	46	N/A	Informative	No			
Peralta	40	5,000	Informative	Occasionally			
Arcos[1]	30	N/A		No			
Espartinas[1]	22	N/A		No			
Rest of Europe							
Guérande	93	130,000	Informative	Year-round	3	3	1x/year
Sečovlje	91	45,000	Informative	Year-round	2	1	1x/year
Læsø	75	60,000		Year-round	1		Occasionally

[1]Spontaneous visitors in these sites are in fact actively discouraged by means of warning signs, cut-off roads or even fake video surveillance, [2]A proper museum, a collection of salt-related items or a permanent exhibit
Source: Own elaboration

7.5 Axis 3: Health and wellness

As said earlier, there is a long lasting tradition of using salt and its by-products for health purposes. Brine can be employed for bathing or immersing certain parts of the body in it, rubbing or inhaling it as aerosols. Here follows a brief review of health and wellness applications of salt and brine. Salt itself has also applications as rubs or in the form of lamps, for example.

7.5.1 The uses of brine

Brine baths

Brine baths can be taken on site or in balneo- or thalassotherapy centres, which were traditionally located near the source of brine or salt water. Today, many such centres exist elsewhere, too, regardless of the existence of a nearby salt making site. A distinction should be made between acknowledged minero-medicinal waters (whether for bathing or ingesting), which need to comply with certain requirements and regulations, and other waters, which can be labelled as "spa", "wellness" or similar terms, but have not been acknowledged or proven as having threapeutic properties. Each country has its own regulations and comparing them goes beyond the scope of this work; suffice to say it is an issue subject to commercial interests and, therefore, prone to terminological manipulation.

Bathing can be done in low concentrated brine –sea water or similar– or in saturated brine, close to precipitation. Spas usually offer a range of baths. Those situated at the coast may benefit directly from sea water and those inland use brine from nearby sources or create their own brine by dissolving salt in freshwater. Low concentrated baths consist of larger pools and are usually employed for more leisurely activities. These are also typically found in

many similar centres that use mineralized waters, spread throughout the world. Saturated brine baths are more commonly used for treatment and are used under professional supervision. Given the pain this brine can inflict to our eyes or nostrils, the activity in such baths is minimal and usually consists of simply floating. In some cases, a time limit is given to patients. The health indications are very diverse, e.g. skin and respiratory diseases, inflammatory and non-inflammatory rheumatic diseases, gynaecological diseases and infertility, and general susceptibility to infection and psycho-fatigue (Falkenbach 2010).

None of the Spanish inland study sites has built a proper spa and wellness centre associated to their salinas as of yet. An attempt was made in Imón, with the Spa *Baños de Ymón*, but in fact, this centre was totally unrelated to the salt making activity and used brine that was obtained by mixing salt and water. Elsewhere in Spain, some spas have made use of saltwater or brine springs that have not been exploited for salt making purposes. A classical example is the *Hotel Balneario Las Salinas*, in Medina del Campo (Valladolid), opened in 1891. A more modern thalassotherapy centre using a local brine spring, *Balneario Elgorriaga*, is located in Navarra. Central Europe has a strong tradition of bathing in mineralized waters. Many brine springs have been used as sources of bathing waters, as well as for the production of salt. In France, the *Thermes* of Salies de Béarn, Salies du Salat or at Salinas-les-Bains are traditional thalassotherapy centres associated to (former) inland salt making sites.

In German-speaking areas, traditional bathing towns are typically named "Bad…" and toponymy comes to an aid with numerous references to salt. Examples are Bad Salzelmen, Bad Salzungen, Bad Sooden-Allendorf, Bad Salzdetfurth, Salzkotten, Bad Salzuflen, Bad Soden Salmünster, Salzgitter-Bad, etc. In Salzkammergut, a mountain district in Austria rich in salt springs and former salt mines, several such centres exist, too. In the European study sites, both Læsø and Sečovlje host modern thalassotherapy centres: *Læsø Kur* and *Lepa Vida*, respectively. Chapter 6 offers more details on these facilities. Elsewhere at the coast, the Mar Menor region in eastern Spain, home to three salt making sites, has a tradition of health bathing, but is unrelated to the salt making activity. In Aveiro, Portugal, following the example of similar sites, two salinas –the Marinhas Grã Caravela and Peijota– have opened the *Piscina e Spa Cale do Oiro* (Pool and Spa Cale do Oiro) to the public. In general, there is not such a strong tradition of thalassotherapy associated to coastal salinas as it exists elsewhere in the interior.

Saturated brine baths have been commonplace in inland salt making sites. People from the neighbouring towns would flock to the salinas in order to take a bath in the concentration basins, a practice sometimes tolerated, or sometimes clandestine, but still much remembered today. This was a regular practice in some of the study sites such as Imón, Peralta de la Sal, Salinas de Añana, Poza de la Sal or Saelices de la Sal. Elsewhere, the idea has even been recovered in Naval, in Huesca; Cambrils and Vilanova de la Sal, in Lleida; and vague plans were mentioned for Carcaballana in Madrid, for a larger sized facility. In the rest of Europe, some Mediterranean salinas have been used for informal bathing too. Such was the case of saline di Marsala in Sicily (pers. obs.). Some inland salt making sites even had proper bathhouses, such as Belinchón, in Cuenca, now in disuse. Interestingly, one of the concentration basins in the salinas of Tragacete, in the same province, has been transformed into a private swimming pool. It is uncertain whether their owners knew the health implications of bathing in brine or was it simply a convenient infrastructure?

Figure 7.13: Woman using the *maniluvium* in Salinas de Añana (©Fundación Valle Salado)

An additional twist to floating in brine is doing it In a so called *flotarium*. This is a device in which one person can be lain to float in a confined recipient, isolated from external stimuli. The idea behind it is to achieve a deep state of relaxation without any distractions from the outside. In medical terms, this relaxation technique is also known as REST (Restricted Environmental Stimulation Technique). These devices can be installed almost anywhere, as they are slightly bigger than a bathtub. There are therefore versions for domestic use on the market, but are also often found in urban spas.

A more simple version of brine baths is the immersion of the extremities, with therapeutical purposes. Depending on the extremity concerned, it is called *maniluvium* or *pediluvium* (Figure 7.13). The first consists on submerging the hand or the lower arm into brine and to perform some simple exercices while submerged. The *pediluvium* may consist of simply standing or walking in brine, or making some exercises with the feet or lower legs. Some of the study sites offer these services on the spot under professional guidance, such as Salinas de Añana or Læsø. Elsewhere, this idea is gaining popularity, give the simplicity of the facilities needed (often, actually, none). Examples are Salinas de Chiclana in Cádiz or Salinas Biomaris in Huelva.

Ingestion of brine and brine pads

Drinking brine is one of those health trends that regularly hits the press. The internet brimes with pro's and con's and recipes for a good glass of "pickle juice". Others claim the benefits of drinking purified sea water. Its defenders declare that it "can supply the body with the natural energy stored in the [salt] crystals, […] can harmonize the alkaline/acidity balance in the body and normalize blood pressure, can dissolve and eliminate sediments which lead to stones and various forms of rheumatism like arthritis and kidney and gall bladder stones, can lower the craving for addictive desires and can help with skin diseases by cleaning from inside

out"[139]. Some consensus seems to exist, though, on the benefitial effect of pickle juice on muscle cramps (e.g. Miller *et al.* 2009). Brine can also be used in numerous applications as a home-made substitute of physiological serum. Typically, it is used as a nose, eye and throat rinsing remedy (e.g. Hildenbrand *et al.* 2011, Sandu *et al.* 2015). Also, brine poultices or pads are useful remedies for skin, muscular and joint diseases and injuries. Insect bites can be easily alleviated with them (Weihofen 2002).

Inhaling brine

Graduation towers were traditionally used to concentrate the brine from inland saltwater sources before its crystallization in simmering pans. This construction was common in climates where salt making was not possible by solar evaporation. They would measure 6-16 m in height and could reach a few hundred meters to almost 2 km in length. These elongated towers were made of imbricated stacks of thin branches of, most usually, blackthorn (*Prunus spinosa*), on top of which the brine was sprinkled. The brine would then slowly trickle downwards until it was again collected in a pipe at the bottom of the stack. Due to the slow movement of the brine and its exposure to the wind, part of the water would have evaporated and the collected brine would be stronger[140]. This way, the final evaporation process would be faster and less constly in terms of fuel (Affelt 2003, Emons & Walter 1988). These graduation towers were commonly used in central and northern Europe between the 16th and the early 20th century. Germany is especially rich in this type of facility (e.g. Bad Dürkheim, Bad Salzuflen, Bad Reichenhall, Bad Dürrenberg, Bad Hamm… [141]), but graduation towers can also be found in Poland (e.g. Ciechocinek), France (e.g. Arc-et-Senans), The Netherlands (e.g. Katwijk, which by the way used sea water; now disappeared), Austria (e.g. Hall), Denmark, Slovenia…

Many of these facilities have had an application as health centres. Since the Antiquity, the inhalation of seawater aerosols has been considered healthy and graduation towers reproduced this type of environment in places far from the seashore. Patients of respiratory illnesses such as asthma or allergies, or skin conditions such as psoriasis, have been said to improve with brine aerosol treatments. Many of the former salt making sites that used graduation towers, are still being open as health centres, with more or less sophisticated treatments on offer. Former graduation towers have been recovered (e.g. Affelt 2003) not only for the purpose of heritage but also for renovated health uses. In some cases, even new, smaller sized graduation towers have been built, associated to spa and wellness centres that use the brine also for baths. This is the case of *Sole-Arena*, opened in 2010 in Bad Essen, Germany. Even indoor graduation towers have been built on purpose as part of larger wellness centres, as has been the case elsewhere in Germany or Switzerland.

[139] Just an example of these lists of benefits, obtained from a randomly chosen website. URL: http://www.gaiathera.com/e/salt/4_brine.html [Retrieved August 2016]

[140] In some cases, such as Bad Salzungen in Germany, an increase has been registered from 6% salt in the original saltwater to 27% of salt in the resulting brine, almost to the point of crystallising (URL: http://solewelt.de/, [Retrieved August 2016])

[141] A complete list of German graduation towers and their present uses can be found in URL: http://www.gradierwerk-saline.de [Retrieved August 2016]

7.5.2 Halotherapy

Halotheraphy, literally, salt therapy, is usually associated to the therapeutic effect of being in a salty environment. It is said that it was already practised in the Antiquity (Gallicchio 2014) and ethnoarchaeological research has shown that many current traditional halotherapeutic practices (intra-cranial, aural, inter-costal, menstrual and rheumatic neuralgias, flu, dental hygiene, hemostasis, burns, asthma, bronchitis, etc.) are based on ancient practices, whereas some have dissapeared over time and new ones have emerged (Alexianu *et al.* 2008, Curcă 2007, Sandu *et al*. 2009, 2010). Leroy (1980) claimed that the salt marshes of Guérande offered a combination of therapies based on the sun, wind, salt and other minerals present in the sea aerosols. However, the term halotherapy is today more often associated to therapies applied in salt mines, therefore also known as speleotherapy, whereas other salt-related therapies have their own specific names (see above). It does not involve invasive procedures, nor the use of medication or supplements, immobilization in bed or diets. In halotherapy, the the salt enters the body through respiratory inhalation of saline aerosols and absorption through the skin (Canache *et al.* 2012, Lazarescu *et al.* 2014, Zając *et al*. 2014) and the efficacy of halotherapy has been demonstrated by biochemical, immunological and microbiological research (Chervinskaya & Zilber 1995). The use of salt mines for these purposes, however, has been geographically restricted to central-eastern European countries, with well-known sites suchas as Wielizcka or Bochnia in Poland; Solotvyno in Ukraine; and Târgu-Ocna or Slanic Prahova, among others, in Romania (Frączek 2013, d'Obyrn & Rajchel 2014, Płaziak & Szymańska 2015, Unguraş et al. 2009, Wiszniewski 2015) although it is gaining notoriety elsewhere in the world.

Salt making sites, whether in operation or inactive (salinas, mines and graduation towers), offer a unique combination of health and leisure possibilities that are being exploited at different scales in Europe. Mines such as Wielizcka, protected as a World Heritage Site, offer their facilities both for regular visitors, as for patients. The latter also take the opportunity to practise "spa tourism", that is, spending the time free from treatment for leisure activities (Langer 2014, Płaziak & Szymańska 2015, see also above); conversely, the salt mine of Turda in Romania, traditionally been open for halotreatment, has broadened their offer to include regular visitors, too (Morea *et al.* 2016). Similarly, the solar saltworks of Nin aim at offering combined cultural and ecotourism experiences (e.g. birdwatching) with the provision of health services (Bosna & Miletić 2016) a trend found in many other solar evaporation salinas. Thus, leisure and health provision go hand in hand. This is a common situation in most therapeutic salt mines, in which complementary infrastructures such as playgrounds, cafés, shops, rest areas and even chapels can be found. The idea is that patients need to spend some time underground for the therapy to work and can be thus entertained; or may bring their family along for a day out. In Romania, a visit to the mine of Slanic-Prahova can also be combined with bathing in a saline lake and a visit to the local salt museum. Western European salt mines, whether abandoned or not, can increase their revenues by combining uses in a similar way.

There are many salt caves or caverns –the so called halochambers– newly built for health purposes[142]. It only needs a few large blocks of rock salt to create a similar environment to that of a mine, without the need of travelling to a usually remote location. Another option is the use of halogenerators, which are sophisticated devices used to simulate the atmosphere of salt mines. These crush rock salt into dry micrometer sized particles, which are then ionized and released into the air (Gallicchio 2014, Langer 2014). These solutions allow having a more

[142] In Australia, there is salt therapy even for horses (URL: http://equinesalttherapy.com/, [Retrieved April 2016])

conveniently located venue with cheaper facilities than natural salt mines. But, above all, it allows the application of controlled halotherapy, that is, to manage the concentration and composition of the aerosols the patients inhale. Artificial salt caves have been developed since the end of 80s in Russia (Chervinskaya 2012, Horowitz 2010) and can now be found worldwide in clinics, schools, sanatoriums, rehabilitation centres, spas, hotels, sports halls, etc. They are even available for installation in private homes. Some salt mining companies offer salt blocks on sale for this purpose.

Figure 7.14: The public enjoying a picnic inside the Târgu Ocna salt mine, in Romania (©Katia Hueso)

A more domestic version of a ionizing halogenerator is the salt lamp. They are made of larger sized natural salt crystals, which have been carved and hollowed out. These are then heated –thus ionized– by putting a tealight or lightbulb inside. Although these lamps were originally introduced in the western markets as Himalaya salt lamps, claiming the special benefits of being made of salt from this region (e.g. Weihofen 2002, Jacquemet 2003), many salt mining districts have started to offer their own creations[143] .

7.5.3 Others

Cosmetics and wellness

Mother lay can be used in cosmetics or for direct skin treatment, even for bathing[144]. Direct application of mother lay to the skin has also been recoved as a common practice and can be done in places as far apart as Biomaris (Huelva) or Læsø. It is even sold as spray, to continue the treatment at home. Salt itself is a natural exfoliant that can be used at home or is simply mixed with hydrating cream. It is an environmentally friendly alternative to the plastic

[143] Curiously enough, they are equally pink or orange in colour, a feature previously claimed as exclusive of Himalayan salt. Such lamps are for sale, for instance, at the Parc Cultural de la Muntanya de Sal in Cardona, Spain or in Salzburg, with salt from the Salzkammergut district.

[144] Do not try this if you have open wounds, nor rub it in your eyes, as it is rather painful. It also has a nasty bitter taste, but floating in it is an experience of its own!

microbeads normally used in these products, which are becoming controversial due to their capacity to pollute the seas (e.g. Fendall & Sewell 2009). At an industrial scale, cosmetics also use salt-related substances. Halophiles, mainly found in solar evaporation salinas, are said to contain certain microbiological solutes and compounds (e.g. beta-carotene, melanin, ectoines) useful in the production of cosmetics, especially those related to skin care (Dassarna *et al.* 2010, Oren 2010, Ventosa & Nieto 1995, Yadav 2015).

Form the wellness point of view, aromatised salts or bath salts have traditionally been used for bathing. These salts are very widespread due to the facility in manufacturing them and have become a star product in traditional salt making sites. In salt-related festivals or activities, children are typically invited to create their own bath salts[145]. At a different level, salt is becoming a popular alternative to water treatment in swimming pools. It is said that it does not irritate the eyes or the skin as much as chlorine does, and has a similar disinfectant power. Figure 7.4 shows the salt-related treatments that are being offered in or nearby salt making sites in Europe. Depending on the location, the basis will be tralassotherapeutic (with brine) or halotherapeutic (with rock salt). The map does not include sites not related to (former) salt making sites.

Table 7.5 summarizes the therapeutic possibilities of salt and brine, divinding them into salt- and brine-based therapies. It also distinguishes between treatments to be followed on site, including the type of site required, and off site. Among the former, only three study sites have built thalassotherapeutic facilities associated to the use of brine, namely Añana (in the salina itself), Læsø and Sečovlje (in separate facilities). Surprisingly, Guérande has not yet embraced the health uses of brine and salt, although creams and other wellness products based on Guérande salt are gradually being sold on site.

Table 7.5: Therapeutic possibilities of salt and salinas

Type of material	On site		Off site
	Type of therapy	*Type of site*	Type of therapy
Salt	Halotherapy	Mines	Halochambers Salt lamps Halogenerator Salt scrubs Bath salts
	Salt aerosol inhalation	Graduation towers Solar evaporation salinas	
Brine / others	*Maniluvium* *Pediluvium* Brine baths	Solar evaporation salinas	*Flotarium* / brine baths Pickle juice / sea salt drink Nasal spray Creams, cosmetics

Source: Own elaboration

7.6 The Natural and cultural context

7.6.1 The social and educational uses of saltscapes and salt heritage

Saltscapes and salt heritage never stand alone. There is a local community and territory they necessarily refer to, especially once the patrimonialization of the site has started. The former industrial activity may have taken place with a certain degree of secrecy -often with the

[145] Examples of sites where this is being offered routinely are the Salinar de Naval baths (Huesca) or at the *Jornadas Gastronómicas* (Gastronomical Days), celebrated each year in Salinas de Oro (Navarra), both in Spain. You only need to add concentrated aromas to the salt and let it dry. Some cookbooks guide their readers on how to prepare aromatised salts (Engler 2016, Leitner 2014).

excuse of the competition with other salt making companies- and the local community saw these sites as places of suffering and misery. There was hardly a relationship between the site and its location. Only when the sites undergo some form of patrimonialization, a radical shift takes place not only from within, but also towards the local community and the hinterland: it expands from a corporate, industrial mentality to a community-led heritage conservation activity[146]. The uses of saltscapes and salt heritage, in the context of the local community and the territory they stand on, are based on two main pillars. A practical one, by which conservation instruments and planning documents play a leading role and determine the social and educational uses that may be given to the site, to strengthen the ties with the local community and provide dissemination of its values to residents and visitors. The other one, a more ethereal one, makes use of the aesthetic and symbolic values of the site -and of salt as a universal commodity, for that matter- and presents that to society by means of different cultural manifestations (religion, art, literature, music…). These intangible values are being made use of by the management authorities of the site, too, primarily as a marketing tool. All these aspects are discussed below, with examples of both the study sites as elsewhere within the European cultural and geographical context.

Conservation planning

The conservation of the natural and cultural assests of saltscapes very much depends on the existence of a protection status and a planning document that includes concervation goals. As discussed in Chapter 4, cultural protection measures are very ocassionally supported by a Master Plan, which is the case of Salinas de Añana and Salinas de Poza, in Spain. The master plan of Imón was commissioned by the owners of the site and not by the adminsitration in charge. The other six inland study sites in Spain do not have a complementary conservation planning document. In neither case these went through a public consultation phase, thus cannot be considered an "official" planning instrument. On the other hand, natural protection measures (natural park, Natura 2000…) are complemented by different planning instruments, depending on their category (see also Chapter 4 and Table 7.1). This is the case of Salinas de Añana, which has included these goals in its renewed management plan; Rambla Salada; Salinas de San Juan or Espartinas. Table 7.6 gives some detail of these planning instruments and how they contribute to the conservation of salt heritage.

In addition to these plans, most of them created or supported by the public administration, smaller initiatives take place on site, to preserve the natural and cultural heritage assets. Most of them are brought to life by volunteer work, summer camps and similar actions, that combine heritage recovery, education and entertainment. These consist of a group of people, usually young adults, who spend a few weeks on site and participate in light renovation or maintenance activities. The Asociación La Carraca and the Asociación Calblanque are two NGOs based in the region of, Murcia, SE Spain, that organize volunteer camps devoted to the conservation of inland saltworks of their region (Rambla Salada and El Rasall, respectively). of Murcia, in SE Spain. The volunteer works often consist in sampling the local flora and fauna and monitoring the water, thereby learning to appreciate this type of biodiversity. Similar initiatives are organized in larger, coastal saltworks, such as San Pedro del Pinatar, also in Murcia; Santa Pola, in Alicante; Ses Salines Noves in Mallorca or La Esperanza, in Cádiz, to name a few. Poza de la Sal, in Burgos, has also benefitted from the cooperation between NGOs and public administrations for the organisation of summer camps. They have been celebrated since 2008, and have constituted one of the main pillars

[146] Although, as shall be seen in Chapter 8, this shift may close the circle towards a corporate mentality again, this time being heritage the core of the business.

for the recovery of their salinas, in which locals have also participated actively. In the Valle Salado de Añana, international summer camps are being held and participants take part in the recovery works and learn basic salt making skills. In this case, the recovery of salt heritage does not depend much on these camps, which have a stronger educational character.

Table 7.6 Planning instruments and conservation goals currently in force in the study sites

Site	Score	Title of document	Author	Salt-specific conservation goals
Spain				
Añana	90	Plan de Gestión[1,2] del Valle Salado de Añana	Fundación Valle Salado	The integrated recovery of the Valle Salado
Poza	67	Plan Director[2] para el conjunto de interés cultural de las salinas y su entorno	Regional cultural authority	The recovery of the salinas and their surrounding cultural and natural assets
Rambla S.	64	PORN[3] Humedal del Ajauque y Rambla Salada	Regional environmental authority	To authorise artisanal salt making as cultural heritage To use salt-related instrastructures as environmental education centre
Gerri	55	None (obsolete proposals exist)	(Private entrepreneurs)	(Not oriented towards conservation)
San Juan	54	PORN[3] Alto Tajo	Regional environmental authority	No
		PRUG[1] Alto Tajo		To support recovery projects for cultural heritage
		Plan de Gestión[1] de la ZEC Alto Tajo		To preserve habitats for aquatic halophytes
Imón	46	Plan de Gestión[1] de la ZEC Valle y Salinas del Salado (2015, draft)	Regional environmental authority	To recover the artisanal salt making activity for halophile species conservation and traditional know-how
		Several obsolete proposals exist	Owners, NGOs…	To recover the site for salt making and/or other purposes
Peralta	40	Esquema de planificación[2] de la puesta en valor del Salinar de Peralta de la Sal	Local authority	To recover the artisanal salt making activity for tourism and salt making
Arcos	30	Plan de recuperación[4] de la Ermita del Carmen	Owners	To recover the El Carmen chapel
Espartinas	22	PORN[3] del Parque Regional de los cursos bajos de los ríos Manzanares y Jarama (1999)	Regional environmental authority	No
		Plan de Gestión[1] de la Zona Especial de Conservación "Vegas, Cuestas y Páramos del Sureste de Madrid" (2014)		No
Rest of Europe				
Guérande	93	Document d'Objectifs[1] Marais salants de Guérande, Traicts du Croisic et Dunes de Pen Bron	Local authority	To give the management of active and inactive salt marshes to the salt makers To improve the understaiding of nature by salt makers
Sečovlje	91	Management Plan[1] Landscape Park Sečovlje Salinas (2009)	National authority	To guarantee the maintenance of traditional salt production as an esential tool to conserve the biodiversity of the area
Læsø	75	Natura 2000-plan 2016-2021 Strandenge på Læsø og havet syd herfor (2016-2021)	National authority	No

[1]Management plans and similar, [2]Master plans and similar, [3]Natural resources plans, [4]Plan of partial recovery

Source: Own elaboration

Salinas lend themselves well as social, educational and cultural settings. As has already been discussed in the events section, local stakeholders organised all sorts of events and activities around their site, be it for one purpose or the other. Table 7.7 summarises the main types of events and activities, classified per objective.

Table 7.7: Complementary activities in the study sites

Site	Score	Educational	Social	Cultural
Spain				
Añana	90	Summer camps Workshop school	Fairs Sports	Conferences Concerts
Poza	67	Summer camps	Open-days Local association in charge	Conferences Exhibits
Rambla S.	64	Volunteer work	Local association in charge	Exhibits
Gerri	55	-	Meetings local community	Conferences Exhibits
San Juan	54	-	-	Conferences
Imón	46	-	-	-
Peralta	40	-	-	Conferences
Arcos	30	-	-	-
Espartinas	22	-	-	-
Rest of Europe				
Guérande	93	Professional training	International cooperation	Exhibits
Sečovlje	91	Summer camps	Events local community	Exhibits
Læsø	75	Professional training	-	-

Source: Own elaboration

Educational activities

School visits are the most basic option for salinas to show their heritage to others. These visits have the advantage of being predictable, easy to organise and the public is captive. If nothing goes particularly wrong, they will repeat one year after the other, as they will cater new students. Virtually all active sites offer some kind of school visits and some of the inactive ones (e.g. Peralta) also do. Similar to school visits are those organised by local associations, elderly groups and the like. These may not be as reliable in their regularity, but nevertheless bring large numbers of visitors to the site. Scholarly visits are less frequent and regular, but university teachers have their favourite spots to show to their students and colleagues and make grateful use of versatile sites such as salinas. These visits are usually organised and performed by the leading scholar and do not interact much with the local organisations in charge of the site, and are thus considered some kind of *self-service* visitors. In some cases, they may not even count with permission to access the area. A similar situation occurs with specialised organisations such as cultural associations, minerals collectors or ornithologists, just to name a few special interests groups.

A more complex type of educational activity is the workshop schools, that is, the professional training offered to students learning certain manual crafts, such as masonry, carpentry or restoration. A good example of this is the collaboration between the workshop school Micaela Portilla in Álava and the Fundación Valle Salado, which offers the salinas for their students to practise. But perhaps the most developed example of formal education is the training programme for future salt masters in Guérande, offered by regional chamber of Agriculture (Chambre d'Agriculture Loire-Atlantique, 2011; Thompson, 1999; see Figure 7.15). This programme is open to salt makers that can be in charge of a salt making unit in the future, so it combines education and employment. A similar programme is being developed by the Fundación Valle Salado in Salinas de Añana. Partial training programmes for (future)

salt masters, without a guarantee of employment, have occasionally been offered in Murcia, Canaries and Andalusia. Guérande, which is seen as an example of sustainable salt making worldwide, has an active international cooperation programme through their association *UniverSel*. They support artisanal salt makers from francophone African countries to improve their work conditions and provide them with technical advice.

Figure 7.15: Leaflet advertising the official training to become a salt maker in the French Atlantic salinas (©http://forma.sel.over-blog.com/)

Collaboration with universities to perform field work on site is another typical educational activity. Teachers and students use the site for practice or research. Examples of such cooperation can be found in Salinas de Añana, Poza de la Sal or Imón. The latter has been disrupted since the last change in property (see Chapter 5), but was close in the past. Today, *Sigüenza Universitaria*, an organisation closely cooperating with the University of Alcalá, offers all support to provide visibility to the ailing state of these and other salinas in the region. Aside from this academic approach, another educational activity to be applied in this context is citizen science. Led by researchers, the public can collaborate to obtain relevant data on flora, fauna, state of the buildings, participate in archaeological surveys, interview former salt makers, gather evidence of intangible heritage, etc.

Social and cultural activities

The most evident social activities are those that involve the local community. Aside from the regular events, such as fairs, contests, concerts.. (see above), in some cases a local association is actually in charge of the site. This is the case of Poza de la Sal, in the hands of the *Asociación de Amigos de las Salinas de Poza*, or Rambla Salada, with *Asociación La Carraca* as managing body. Thay have both signed an agreement with the owner, in both cases, a public administration, and have the power to decide how to use the site. In most cases, however, local associations have shown an interest in the site and support their recovery with the little means they usually have (often only human power and motivation). This is the case of the *Sociedad Española de Historia de la Arqueología*, which stimulated the declaration as BIC of Salinas Espartinas; the *Asociación La Sabina*, which is trying to unblock the stagnated relations between the owners of the Salinas de Arcos and the municipality, or the *Asociació Cultural Castell de la Mora*, in Peralta, which is trying to motivate the owners of the salinas to

recover them. Given their limitations, these associations usually offer conferences, exhibits or contests, which are related to the salt heritage they defend. In some cases, the owner of the salina provides a meeting space for local associations or groups. The large builing of *El Alfolí*, in Gerri de la Sal, not only hosts the musuems, but has several rooms that can be used by local associations for their gatherings.

Since salt-related biodiversity has a "low caressing factor", other possible initiatives to disseminate and popularise is the celebrateion of events such as ornithological marathons[147], invertebrate photo contests[148] or even by using pluche toys[149] representing typical animals from the salinas. And getting into a more playful mood, salinas are already being used as spots for geocatching games, with well-knonw sites such as salinas Espartinas, Martos in Jaén or Salinas del Astur in Cádiz. In the rest of Europe, Guérande and Læsø have also been visited by geocatchers. A similar power of attraction for salinas can be expected by the online game *PokemonGo*, launched worldwide in the summer of 2016.

7.6.2 The aesthetic and symbolic perception of saltscapes and salt heritage

In addition to social and cultural events, the salt and saltscapes have other uses, that transcend the mere relation of the site with the salt making activity. On the one hand, the aesthetic and symbolic values of salt have been used by tourism authorities and site management bodies, as a legitimate marketing tool to attract visitors and create a sense of pride and belonging among the local community. Aside from this instrumental use, salt has influenced numerous cultural manifestations, some of which are universal in character[150]; other may be local and yet others, are strongly site-dependent. A few of the latter, given their link to the territory, will be commented here.

The "official" perception of saltscapes and salt

An often-heard comment from first-time visitors to a saltscape is that of surprise. Rarely visitors feel indifferent about a salt making site. A few consider it a hostile place, arid, hot,

[147] Bird protection societies often organise a contest which consists in spotting as many birds as possible within one day and within one particular area. Anyone may take part, whether individually or in groups and participation with children is especially encouraged. Regardless of performance, every participant gets a small present or token of appreciation for their effort.

[148] An internet forum specialised in invertebrates regularly organises a photo contest about aquarium invertebrates, open to everyone interested. A photo contest (and of course an exhibit of the best photos, later on) of the insect or plant life of salinas may be a good way to raise awareness of their existence and fragility among the public.

[149] A private company sells pluche versions of unpopular invertebrates and even microscopic organisms such as bacteria and viruses that cause well known diseases. Each of them comes with a photograph and information about the real "microbe" it represents. Its clients include teachers, health workers and educators, who use them in all kinds of dissemination work, but also to dedramatise these type of creatures. Pluche halobacteriae or *Artemia* could be used to introduce the general public into the inconspicuous biodiversity of salinas. They can be found at URL: http://www.giantmicrobes.com [Retrieved August 2016]

[150] Salt has a strong symbolic value in different cultural contexts. The most typical ones are related to purification (e.g. Japanese sumo wrestlers throwing salt at the *tatami*), hospitality (e.g. offering bread and salt to guests, practised in Eastern Europe) and luck (e.g. throwing salt over one's shoulder to avoid omens, an almost universal gesture). Some of them have been mentioned in previous chapters of this work.

devoid of life (because of the abundance of salt), but most of them mention the harmony of the lines in the water and the delicate balance between wild and constructed nature; or between water and land. These are features that are also highlighted in brochures and websites. The idea of unveiling a secret is expressed in older brochures referring to salinas de Añana, in which it says "*Ven a descubrir*" ("come discover"), although most insistent are the salt marshes of Guérande, with the buzzword "*découverte*" ("discovery") in virtually every leaflet, brochure and website. Others are keen on inviting visitors to experience their uniqueness: "*una experiencia única*" ("a unique experience"), in Añana or "*en ekstraordinær oplevelse*" ("an extraordinary experience") at Læsø Kur. Authorities may also invite us to spend "*un día diferente*" ("a different day"), as happens in Fuerteventura, perhaps to move tourists away from the well-trodden sea & sun model of leisure. References to the past are common, such as "*riquezas olvidadas*" ("forgotten richnesses"), found in a leaflet on the inland salinas of Murcia. That salt making sites can offer rich sensorial experiences is clearly expressed in the somewhat stereotype wording "*tot un món de sensacions*" ("a world of feelings") in a leaflet on the salinas of Cambrils in Lleida. A hotel in Imón advertises itself as the place "*donde se escucha el silencio*" ("where you can listen to the silence"). The descriptions of the saltscape and the salt values, tend to be more poetic in inland sites, in which the historical and architectural values are especially highlighted.

Coastal salinas are more often described in a matter-of-fact fashion, with descriptions of flora, fauna and salt making itself. However, salt making sites in tourist areas, such as Es Trenc in Mallorca, offer a more sophisticated image, with a white and blue pure Mediterranean aesthetics and sell their shop as a "gourmet lounge and delicatessen". Former salt mines have a more nostalgic narrative, referring to the glorious past of the site, as it happens in Cardona, and offering a wealth of old black and white photographs of the site when it was still active. The design of the dissemination materials can be quite amateur in the case of associations, but when professionals do it, they tend to use colours and fonts that give an idea of quality, historical richness or environmental quality, depending on the case. In Guérande or Læsø, the typesetting of the leaflets clearly refers to Breton or old Danish calligraphy, respectively. A curious case is the salinas of Aveiro, in Portugal, advertised with the slogan "since 959". The reader initially misses the first figure, until one realises how old the site really is.

When advertising their sites, managers often make use of word games that sound fresh and stick to the mind. Examples are "*sel à vie*" in Guérande, "*sal y descúbrenos*" in Añana or "a pinch of the Mediterranean" in Sečovlje. In other cases, they use catchy slogans that play with the heritage assets offered. For example, the Læsø saltworks is advertised as "the taste of a good story", whereas Guérande is presented as "*pays et gens du sel*" ("land and people of salt"). Sečovlje salt is poetically defined as "salt is the sea that could not return to the sky", whereas mother lay is considered "the mother of all waters". A stay in Lepa Vida, near the latter site, is advertised as "pampering the body, caressing the soul". In Rio Maior, the only inland site in Portugal, the salt is defined as "*sal sem mar*" ("salt without sea").

With respect to the salt itself, it is often described with the words "traditional", "artisanal", "natural"… Values such as authenticity, simplicity, union between humans and nature or age-old tradition are often designed. The presentation of the salts often uses high quality materials, with designer labels and packaging, such as glass, metal or ceramics, suggesting that they hold a precious item (Figure 7.16).

In this context, worth mentioning are the subtle distinctions between "*sal mineral*" ("mineral salt") from Poza de la Sal, "*sal mineral de manantial*"[151] ("mineral salt from a brine source") from Añana and "*sal de manantial*" ("salt from a brine source") from Naval.

(©Fundación Valle Salado)

(©http://www.leguerandais.fr/)

(©http://green-gourmet.dk/salt/)

(©http://www.soline.si/)

Figure 7.16: Some of the salt products offered by Salinas de Añana (upper left), Guérande (upper right), Læsø (lower left) and Sečovlje (lower right). Note the care taken in the packagings and the composition of the photographs.

The many different names used in salt labels have been discussed earlier in this chapter, but I would like to insist in the care needed to choose the right words if the site targets an international audience. Some names sound very good in one language but lose all their charm when translated. My favourite example is the salt from Bad Essen, sold as "*Urmeersalz*", which can be translated as "salt from the primitive sea". Bearing in mind that most artisanal salt makers hope to or do export their salt, this needs to be considered.

The symbolic perception of salt

The most obvious manifestations around the intangible heritage of salt are derived from the practise of faith. The construction of the catholic catherals of Zipaquirá (Colombia) and Wieliczka (Poland) inside salt mines is a striking translation of the faith of the miners who worked in them. Smaller temples can be found in the salt mine of Târgu-Ocna (Romania). Services have also been offered in salt making sites. The tradition of offering a mass at the

[151] It is said that the first packaging with the current design said "mineral salt", but the salt makers heavily protested against this denomination, as they wanted, precisely, to distinguish themselves from the idea of being a mining activity. Hence the new denomination.

Magdalena chapel, in the upper section of the salinas in Poza de la Sal, was recently discontinued due to the collapse of the bell gable. Another well-known celebration is the Feast of El Carmen y de la Sal, in San Fernando, Spain, where a procession is made in the sea. The *Virgen del Carmen* is the patron saint of those who work at sea, which in the Bay of Cádiz of course includes saltworkers, hence the double name of the feast. At a more intimate level, salt was traditionally use for christening children. In Cardona, local craftspeople have carved small crosses and similar pieces with rock salt. These are given to the child on the occasion of baptism. Many other feasts, traditions and events now exist around salt, as have been discussed previously. Salt is also commonly used in pagan rituals and magic spells. The internet offers many different such applications[152] of salt and countless books exist with all sorts of recipes for a better health and wealth based purely on belief or, at the most, weak science (Jacquemet 2003, Weihofen 2002). Some of them are well adapted to modern life, including for instance a remedy to avoid traffic fines (Magali 2002).

The aesthetic perception of saltscapes

Old photographs of the salt making activity in the early 20th century abound all over Europe. The advent of photography coincided with an effort to privatise and industrialise the salt making business and was hence a focus of interest. French scholar Loic Ménanteau has probably the most extensive collection of graphic art (engravings, maps, photographs, postcards) related to salt making in Spain and France, most of it related to coastal salinas, although the author is often unknown. Of course Guérande and the other Atlantic sites were often depicted in them (Buron 1999, 2000). Fewer old photographs have been found of Sečovlje and, of course, are inexistent in the case of Læsø. Interestingly, the salinas of Sečovlje have been represented in a Slovenian postage stamp. In the Spanish study sites, photographs have been taken of Gerri de la Sal, by Bartolomeu Casanovas (ca. 1905); of Imón, by Tomás Camarillo (ca. 1930); of Poza de la Sal, by Ramiro Eizaguirre (1960s; Figure 7.17); and of Salinas de Añana by Ángel María Ortiz (1966). In 2016, an anonymous photograph taken in Arcos de las Salinas between 1900 and 1910 was offered for sale at a collector's internet portal. The *Condominio de Propietarios de las Salinas de Imón y La Olmeda*, managers of the salinas of Imón, commissioned a series of photographs in the 1930s, intended for commercial use. They were offered to their business contacts as a bundle of postcards. In all other study sites, only some private photographs exist. Perhaps worth mentioning are the shots taken on site by photographer and film maker Carlos Saura when he directed the film *La Caza* (The Hunt), very close to the site of Salinas Espartinas. The atmosphere of the place is certainly well captured in them.

Modern photographers and painters have also been awestruck at the beauty of saltscapes. Examples are Simon Butterworth's aerial shots of the Shark Bay saltfields in Australia; Chris Benton's of the San Francisco Bay saltworks, or Yann Arthus-Bertrand's images from different saltscapes of the world. The paintings of Australian salt lakes by Sarrita & Tarisse King, clearly influenced by aboriginal art, or the digital artwork of Phill Petrovic, on the Aral Sea, are just other examples. When looking at salt making places, a number of contemporary French painters have been inspired by the Atlantic salt marshes. Examples are Olivier Laplace, Isabelle Alberge, Vincent Ricordeau, Céline Wattecamps, Jean-Luc Richard, Geneviève Decroix, René-Yves Creston, etc. Those paintings of these sites made at the turn of the 19th to 20th centuries, reflect how little they have changed over the last century. As an example,

[152] To illustrate this, a combined search of the words "salt" and "magic" in http://www.google.com gives 36 million hits; "salt" and "remedy", 16,5 million hits; and "salt" and "ritual", over 500,000 hits [Retrieved August 2016].

Emmanuel Lansyer with his "Marais salant sur la route de Bouin à Machecoul" (1875) or Mathurin Meheut's "Paludiers, un soir d'orage" (1926). Other painters have depicted Atlantic coastal salinas in Cádiz or the Canaries (see a good overview of these in Román 2014). Older paintings of salinas are rare, with some exceptions, such as "Paludier à haler du gros sel" by Lambert Doomer, in 1646 (Buron 2000). In general, before the 20th century, representations of individual salt makers and their way of life were more common than the landscapes they worked on. The exaltation of nature in landscape painting focused on meadows and mountains, rather than wetlands; the latter were considered unhealthy environments and not worth depicting (Goeldner-Gianella *et al.* 2011). This is especially the case of inland salinas, very rarely seen on canvas.

Figure 7.17: Salt maker in Poza de la Sal,
by Ramiro Eizaguirre (Courtesy of Narciso Padrones)

A young discipline such as Land Art has a strong connection to saltscapes. It is not by chance that the first and most cited work of Land Art has been installed in a salt lake. Robert Smithson built "Spiral Jetty", a huge spiral made of local basalt stone, at the shore of the Great Salt Lake in Utah, USA, in 1968. The spiral spent some time submerged and is now again visible, but weathered by erosion and salt. This type of organic evolution is precisely one of the goals of Land Art. Another often cited work is "The Tree of Life", by Swedish artist Karl Momen (1980s), located in the Bonneville salt flats in Utah. So did Frenchman Vincent Lamoroux, with his work simply named "Salt flats" (2007). Elsewhere, other saltscapes have inspired land artists: Julia Davis' "Headspace" (2010) made a head of salt and put it on the floor of lake Brown, Western Australia. Davis has also performed other works related to salt. In another western Australian salt basin, lake Ballard, British artist Antony Gormley installed 51 sculptures modelled on local aboriginals, as part of his "Inside Australia" project (2003). Other artists worth mentioning are Israeli sculptor Buki Schwartz, who installed the "Dead Sea Sculpture" (1986), at Ein Bokek, on the western shore of the Dead Sea. Dutch visual artist Scarlett Hooft Graafland combines land art installations and performances, with photography. She has performed a number of works in the salt lakes of Bolivia. Examples of her work are "Sweating sweethearts" (2004), "Vanishing traces" (2006), "Chairs" (2011), etc. When looking at salt making sites, Figueira da Foz, in Portugal, stands out as a site sensitive to art, with several artists exhibiting at the museum *Núcleo Museológico do Sal*, the local salt

museum. Portuguese artist João Pedro Silva installed his "Presenças, Ausências" on the very surface of the productive area, in 2009. Silva took also part in the "Projecto Algarve: percursos de mar e montanha", with his work "Sobre o branco o tempo poisa" (2015) installed in Castro Marim (Algarve), made entirely of salt. Some salt making sites are even used as training grounds for designers and architects, who are invited to use their creativity and propose new uses for them, albeit at a theoretical level. In 2003 the exhibit "Imón vivo" in Sigüenza, Spain, showed the works of the students of José María Mercé, at the time professor at the Polytechnic University in Madrid (Hueso & Gil 2016).

Public sculptures are common in salt making sites, usually honouring salt makers. Famous are the twin statues of the *Marnoto* and *Salineira* (male and female salt makers, respectively) atop a bridge in Aveiro, Portugal. From the point of view of public art, this town truly deserves mentioning. Several ceramic murals also depict scenes of their salinas. Even the pavement, made of cobbles, refers to salt, with regular little salt mounds represented on the streets. It is thus clear that Aveiro breathes a salt identity of its own. In the Bay of Cádiz, another salt making region, there is a sculpture of three salt mounds that rather remind of the Egyptian pyramids. As it stands in the middle of a busy roundabout, it cannot be enjoyed at leisure. The human element may be missing in this one, but not in a similar sculpture in Rio Maior, Portugal, where a salt maker stands next to the mounds. In Batz-sur-Mer, close to the salinas of Guérande, a bronze, real-sized female salt porter is standing next to the *Musée des Marais salants*, actually being it logo (Figure 7.11).

Salt and saltscapes in contemporary literature

Starting with the younger readers, children's books explaining the functioning of a salt making site exist, but are usually sold on site and hard to be found elsewhere. Other, locally produced texts, tell children stories that take place on a given salt making area and use characters from typical animals such as flamingoes or even a grain of salt. Yet others offer popular tales on the origin of salt. "The salt mill" is by far the most popular one. Other folk tales around salt are "The three daughters of the King", of which many versions have been written[153]; "The salt merchant and his donkey", a fable by Aesop; "The little house of sugar and salt", from Lebanon and "The salt mountain", from Russia. Some authors have even used a comic character to create an adventure around salt. Such is the case of "L'or blanc" ("White gold"), by Daniel Bardet and François Dermaut (2008) within the series *Les chemins de Malefosse* (see Figure 7.18).

With the excuse of salt, some fiction books or plays have been written. Examples are "*Saltets vej*" ("The salt road", Vellev 1997), a play performed "on the road" between Viborg –the seat of the bishop, owner of the saltworks of Læsø–, and Læsø itself. Sylvia de Boer's (1999) novel for young readers, "*Zout*" ("Salt"), describes an underground salt civilization. Saltscapes have also served as a backdrop for other stories, such as "*León Bocanegra*" by Alberto Vázquez-Figueroa (2001), a story about 17th century seamen captured by Bedouins and sent to a salt mine in the Saharan desert. Writer and columnist Arturo Pérez-Reverte (2010), often inspired by nautical themes, has also shown his admiration for coastal saltscapes. In one of his novels, "*El asedio*" ("The siege"), the salinas of Cádiz are often cited. Similarly, Jean-Luc Bannalec (2015), a well-known German serial *krimi* writer, in his third book "*Bretonisches gold*" ("*Marais sanglants*", in its version in French) sent his main character Comissaire Dupin

[153] These websites cover many of the different versions of both tales: URL: http://www.pitt.edu/~dash/type0565.html (The salt mill) and URL: http://www.pitt.edu/~dash/salt.html (The three daughters of the King) [Retrieved August 2016]

to the salt marshes of Guérande to solve a case. In the historical novel "*El Rey Pequeño*" ("The Little king"), by Antonio Pérez Henares (2016), the main character visits the salinas of Imón.

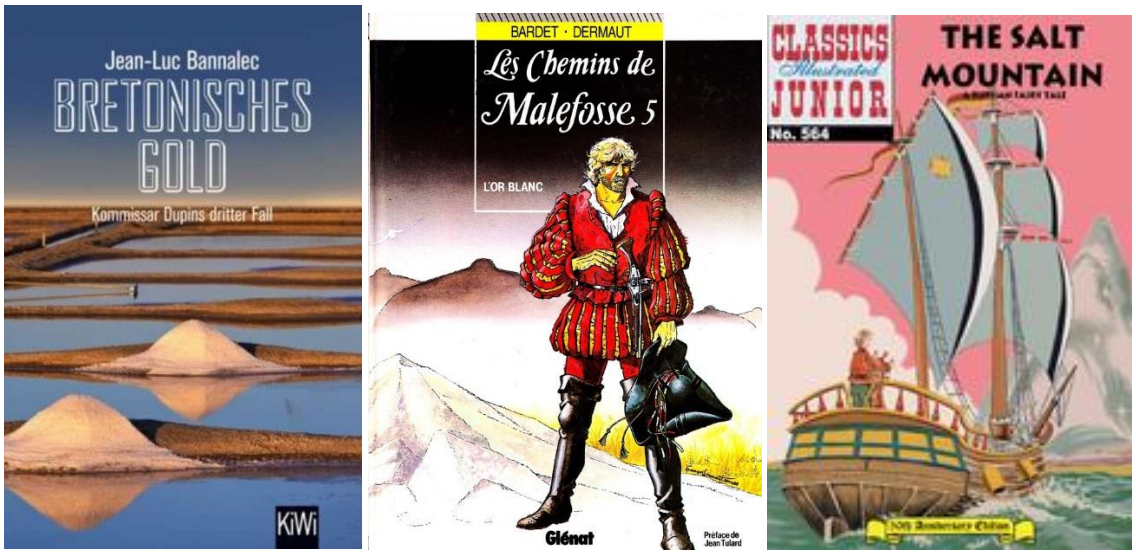


Figure 7.18: Some of the fiction works taking place in saltscapes (Coll. Katia Hueso/IPAISAL)

Salt in poetry and popular music

Poetry has also been influenced by the symbolic power of salt. Famous are the verses of Pablo Neruda, with his "*Oda a la sal*" ("Ode to salt", Neruda, 1957):

> "*…la minúscula ola del salero*
> *nos enseña no sólo*
> *su doméstica blancura,*
> *sino el sabor central del infinito*"
> "Oda a la sal" (fragment)

> (…the minuscule wave of salt
> not only shows us
> its domestic whiteness
> but the main taste of infinite)

or by Rafael Alberti, in his poem "*Salinero*" ("Saltmaker", Alberti, 1924):

> "*…dejo de ser marinero, madre,*
> *por ser salinero*"
> "Salinero" (fragment)

> (…I quit being a seaman, mother,
> to become a salt maker)

Andalusian poets and singers have been especially prolific on salt-related lyrics. Federico García Lorca, Luis Cernuda or Camarón de la Isla are other well-known names citing salt in their œuvre (see an extensive review in Román 2014). Poet Víctor Fernández, a.k.a. *El salinero,* was a salt master and goat herder from Lanzarote, Canary Islands. His poems dealt will daily

life issues, although he did not refer much to his work at the salinas. Only these two verses cite it, from a quite personal perspective (de la Hoz 1977).

> "*…Trabajando en salinas*
> *pero descansa*
> *mi alma en la conciencia*
> *y en la esperanza…*"
> "Víctor Fernández" (fragment)

> "*…Cobradores de jornales*
> *que en las salinas ganáis*
> *a mi casa no volváis*
> *a que os haga los vales…*"
> "*Mi despedida*" ("My farewell", fragment)

When looking at inland salinas, again, the references are less conspicuous: Agustín de Foxá, poet and diplomat, was a regular visitor to Sigüenza. He marveled at the numerous salinas found in the area, among which, of course, Imón (de Foxá 1949).

> "*Las salinas de Sigüenza*
> *¡qué lejos están del mar!*
> *para tu alcoba, mi niña,*
> *"te haré un velero de sal".*
> *Se cree torre costera,*
> *o faro, la catedral*
> *cuando la brisa salada*
> *llega dormida al altar*
>
> *Volando por las salinas*
> *Que están cerca del trigal*
> *¡ya eres húmeda gaviota!,*
> *Paloma del palomar.*
> *Sedientos, los salineros,*
> *Pregunta, ¿dónde está el mar?*
> *¿Quién tuviera en vez de un carro*
> *un barco para remar!*
>
> *Sigüenza ¿por qué te hablaron*
> *de arados y de trillar?*
> *si tienes sueños de brújula*
> *bajo la estrella polar?*
> *¡Sigüenza, puerto sin agua,*
> *con tu Doncel capitán*
> *leyendo un libro de náutica*
> *bajo el plomado cristal!*
> *Si algún día pinto un mapa*
> *Te pondré en el litoral.*"

Ethnographer José Sanz y Díaz collected popular verses in the region of Molina de Aragón, in eastern Guadalajara, an area rich in salinas (among which, San Juan, in Saelices de la Sal). Some of the verses dedicated to salt were (Sanz y Díaz 1983):

"*Tierzo tiene unas salinas*
Terraza un buen mirador
pero Terzaga las gana
con la Virgen del Amor"

Incidentally, Terzaga also hosts salinas, as is expressed in this verse:

"*Fuenbellida es una rosa*
Teroleja es un rosal
mas las mozas de Terzaga
se llevan toda la sal"

This other verse, according to the author, alludes to aragonite, a typical mineral from the area. But it may also refer to the abundance of salinas in the region:

"*De tierra Molina sale*
la piedra fundamental
por eso las molinesas
van derramando la sal"

He also found verses referring to the salinas of Imón:

"*No hay carretera sin Puente*
desierto sin arenal
ni muchachita de Imón
que no tenga gracia y sal"

"*La sal se saca en Imón*
y el anís en Peñalver
las mocitas más saladas
de Balconete han de ser"

Such verses could also be sung. In Poza de la Sal, the following couplet honours Poza and its salt (García Valdivieso 2002):

"*Le dice a la de Pilar*
la Virgen de Poza dice
le dice a la del Pilar
si tú eres aragonesa
yo soy pozana y con sal (bis)
la Virgen de poza dice"

"*Coplas a la Virgen nr 3: Soy pozana y con sal*"
("Couplets to the Virgin Mary nr 3: I am from Poza and with salt")

One of the popular songs often sung at local feasts is "La salinera". Its refrain cannot be more "salty" (García Valdivieso 2002):

> *"¡Ay! Con sal, con sal*
> *¡Ay! Con sal, salero*
> *¡Ay! Con sal y sin sal*
> *Y con sal te quiero"*
> "*La salinera*" ("The woman saltmaker", refrain)

Film making in saltscapes

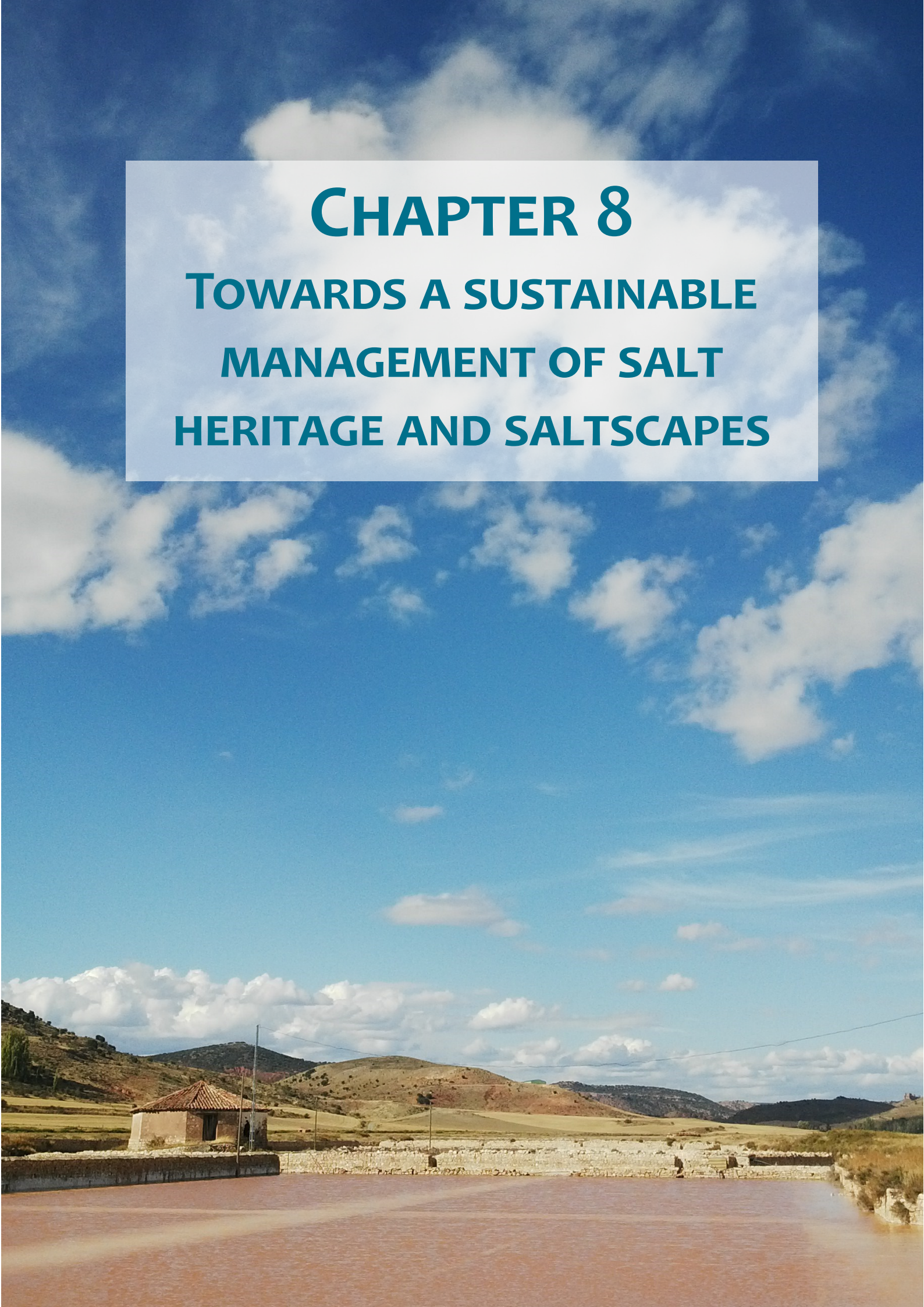
Of a more modern character, the recently recovered salinas de Añana have also been the setting of a movie, "*Rey gitano*" ("Gypsy king"), directed by Juanma Bajo Ulloa (2015). But the first known movie set in a salt making area, which was mentioned above, was Carlos Saura's "*La Caza*" ("The hunt"). When it comes to documentaries, some attention has been paid to saltscapes. As an illustration of this interest, IPAISAL's collection has over 50 documentary films on salt and salinas from all over the world. Focusing on the study sites, the Salinas de Añana were filmed by ethnographer Eugenio Monesma, who made an impressive series of videos on rural life in Spain, eight of which were devoted to salt making. The Fundació La Morisca also made a documentary on Gerri de la Sal, whereas CTT Productions prepared one on Imón, in 1996. Over a decade later, in 2008, Miguel Pavón filmed "*La sal escondida*" ("The hidden salt") on the same site (Figure 7.19).

Figure 7.19: Documentary "The hidden salt" by Miguel Pavón (2008) (Coll. Katia Hueso / IPAISAL)

7.7 Conclusions

This chapter has focused on presenting how saltscapes can combine the different products and services they can offer, compatible with each other and with the sustainable patrimonialization of the site. Although salt making stays central, the associated products and services have been classified in three groups: food and gastronomy, eco-cultural tourism and wellness and health. These may be provided also in case salt making is not possible any longer, albeit in a weaker form. Abundant examples of the different products and services, as well as the combinations among them, are offered, within the European context. Not only the study sites are being analysed, but also other examples of (former) salt making sites that have undergone some degree of patrimonialization elsewhere. Even salt itself can be made with different criteria. A model of different salts is offered, based on scale, technique and final use, but only a certain combination of these factors deems a salt sustainable. Although each salt making site has focused on certain aspects of the associated products and services they offer (e.g. tourism in Añana, health in Sečovlje, or food in Guérande), most of them provide a wide array of them and never neglect the quality of their salt. Those sites with a consolidated patrimonialization process have thus invested in a healthy diversification of these products and services, while trying not to lose their identity. Sites with a partial patrimonialization process of those in its early stages, aim at diversifying, too. In most cases, importance is given to the focus of this offer on the local community and how the latter may benefit from the cultural, gastronomic and health services provided by their landscape of reference. The relationship of the sites to their protection and planning measures is also discussed. Legal protection needs a planning instrument to support actual salt making according to sustainable criteria. Educational and social activities in and around salt constitute an invaluable resource to create identity and sense of belonging and may even contribute to create employment and strengthen the undergoing patrimonalization process on site. Finally, the aesthetic and symbolic perception of the natural and cultural context of saltscapes and salt heritage provides a framework of reference that supports the narratives of the salt making sites under patrimonialization and links them to others and to our own cultural background.

In summary, traditional salinas have suffered a shift in paradigm: From a productive activity inserted in the primary sector, these sites have witnessed a mixed activity in which the production of salt is combined with the provision of services such as tourism, health, nature and culture. This shifts has also implied a 180° turn towards society: from a productive activity with a certain degree of secrecy and where workers had to suffer, to a multifunctional landscape with close ties to the local community that enjoys the pride of workers and residents. The diversity in the offer of products and services is enormous, despite having the same starting point: salt. It should be possible to find a unique combination of all of them that suits the site. The challenge is to keep this offer within the limits of sustainability and to keep the identity of the site alive.



Chapter 8

Towards a sustainable management of salt heritage and saltscapes

Table of Contents Chapter 8

8.1 Introduction

This chapter uses the results offered in Chapters 5 and 6 and the discussion provided in Chapter 7 to analyse the patrimonialization process of the saltscapes and salt heritage studied. To understand the process, a review of the general, environmental, economic and socio-cultural challenges affecting saltscapes and salt heritage is offered, together with a brief SWOT analysis of these sites. Among the latter, special emphasis is given to the issue of ownership of salt making site, given its relevance in the success or failure in patrimonialization processes. The situation of the different study sites with respect to their heritage situation is analysed (sites before patrimonialization; with patrimonialization in progress or with a consolidated patrimonialization process) and includes the pending challenges all the sites have, even the consolidated ones. A mention to other cases of patrimonialization is offered, too. As a result of this analysis, a model of sustainable management of saltscapes and salt heritage is proposed, based on the results of the good practices identified in the case studies. The model identifies five stages in the process of management, to be taken in order, as well as diverse factors that should act as guidelines along the process. This model is intended as a methodological tool not only for saltscapes, but for other types of cultural landscapes, wetlands and rural heritage, which may benefit from the experience of others. An important section of this chapter is devoted to presenting the conclusions of the thesis, which are divided per research question and hypothesis, as they have been presented in Chapter 1. Finally, the last pages provide ideas for further research, stemming from the conclusions of this work. Some broaden the thematic scope (e.g. saline lakes, salt mines), others enlarge the geographic scope and yet others suggest comparative studies with similar heritage manifestations, such as cultural landscapes or industrial heritage.

8.2 Current constraints in the management of salt heritage and saltscapes

The future management of saltscapes faces numerous constraints in Europe (Álvarez *et al*. 2005, Comín *et al.* 1999, Hueso & Carrasco 2008, Montes & Martino 1987). Saltscapes in general and salinas in particular host a number of values (natural, cultural, intangible) and functions (regulation of natural processes; production of commodities and raw materials such as salt, cosmetics, edible plants, microorganisms for biotechnological and industrial applications, etc.; economic activities such as agriculture, husbandry, tourism, recreation, health care, etc.; and education through research, interpretation, etc.; see Chapter 4) that make them complex habitats that require complex and site-specific approaches (Crisman et *al.* 2009, Hammer 1986, Hueso & Carrasco 2008a, Schuyt & Brander 2004, Skinner & Zalewski 1995, Viñals *et al*. 2011b). These constraints can be classified in four groups: the general ones, which affect the saltscape as a whole; and the environmental, social and economic ones, which focus on specific aspects related to the sustainability of the site. The most relevant constraints are discussed in the sections below and are closely linked to the challenges discussed in Chapter 4.

8.2.1 General constraints

The general challenges faced by saltscapes are related to the knowledge that exist on their values. Ignorance of the values of saltscapes makes it difficult to find adequate management strategies. Therefore, the main task is to increase the understanding of the uniqueness of these sites, both among the public as by stakeholders involved in the conservation, protection and use of their heritage values. To this end, it is also necessary to increase the deeper understanding of these sites, a knowledge that can be provided by scholars and academic community.

Raise awareness of stakeholders

Ignorance of the values of saltscapes is more widespread than may seem, and therefore an important task for saltscape managers is to raise awareness on them at different levels (local population, visitors, owners, policy makers, public, etc.). This is the first step to provide understanding on the importance of these sites at a broader scale, and it will contribute to provide resources for their maintenance and recovery. Patrimonialization processes, no matter how basic, should start by offering this knowledge to all stakeholders. Examples of dissemination efforts include publishing leaflets, a website or even books. A good example is the website of the *Fundación Valle Salado*[154], which provides information with different levels of detail and depth. Other strategies include more visible actions such as the organization of events, presence in the media or partnerships with other heritage assets. Again, the *Fundación Valle Salado*, with its concerts, running events, constant presence in local newspapers and internet or agreements with local chefs, is very active in this respect. In other sites (e.g. Imón, Gerri de la Sal, Rambla Salada, etc.) different stakeholders have simply published leaflets or offer public presentations, although these provide a limited effect in time.

It should also be borne in mind that saltscapes, thanks to their unique combination of natural and cultural values, along with their diversity, may offer excellent grounds for educational and interpretation activities from a multidisciplinary perspective (Hueso & Carrasco 2008a). This combination of assets and their links to different disciplines is not often used. In Rambla Salada, the association *La Carraca* has prepared a plan for the interpretation of the natural and cultural heritage of the site. Within this plan, they offer educational activities in which the different aspects of salt heritage come to the light.

Increase research on (inland) saltscape values

The efficient recovery of saltscapes and salinas needs to feed on the knowledge of the potential products and services they can provide. Basic research on saltscapes is still needed. Several authors have suggested several issues of interest, such as diversity and dynamics of halophyllic microorganisms, long term limnological processes, ecological modeling of saline ecosystems, biogeochemistry of saltscapes, cultural tangible and intangible values of saltscapes, etc. (Álvarez 2007, Guerrero & de Wit 1992, Viñals 2002, *et al.* 2011b).

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[154] See URL: http://www.vallesalado.com/VALLE-SALADO-HOME [Retrieved November 2016]. The *Fundación Valle Salado* is also present in social media, where all these actions can be followed on a daily basis: facebook (URL: http://www.facebook.com/ValleSaladodeAnana), twitter (URL: http://twitter.com/ vallesalado) or YouTube (URL: http://www.youtube.com/user/SalinasdeAnana).

Applied research towards the optimal use of saltscape resources (i.e. for biotechnology, electronics, pharmaceutical uses, etc.) may also help recover them in a sound and even profitable way (Hueso & Carrasco 2008a).

Research should also focus on the (new) uses of heritage and how these are compatible with their conservation, as well as among each other. The traditional uses of heritage -mainly via tourism- also needs to be understood in depth, so that adequate management and protection measures can be taken. These uses are dynamic by nature and insight is needed in the drivers and motivations that spark them.

8.2.2 Environmental constraints

Solar evaporation salinas are broadly acknowledged as sites with relevant natural values, some of which are protected. The protection measures can include the site as a whole, or only include certain species that inhabit it. In any case, the legal regulations oblige the site managers to operate taking them into account. Although this can initially be seen as an interference in the daily functioning of the salt making activity, the fact is that both nature conservation and salt production are compatible with each other, as was explained in Chapter 3. Simple actions such as adequate dyke design to avoid terrestrial predation or the installation of artificial nesting islands may contribute to the settlement and permanence of bird communities on site. Birds which, in turn, keep the ecological balance of the trophic network of the salina, thereby indirectly contributing to improve the quality of the salt. Diverting or adapting inner roads and paths may help small terrestrial species to move safely around the site and thrive, again contributing to the ecological balance of the site and, ultimately, to the quality of the brine. The adequate maintenance, by trimming but not removing bushes of halophile flora, provides nesting and refuge habitats for many different species, while keeping the deposits clean of seeds and leaves. Building bird hides provides the opportunity to watch them without disturbing them.… All these measures do not only improve the salt production but improve the aesthetic values of the site. Besides being an asset of its own, it also may attract visitors and hence increase funding for its maintenance[155].

From an ecosystem point of view, an important management challenge for wetlands –especially in Spain–, is for instance the high ratio watershed : wetland, which may reach almost 1,000 : 1, as is the case in the National Park Las Tablas de Daimiel (Ciudad Real, Castile – La Mancha) (Álvarez 2007). This means that conservation measures should not only be designed at the wetland level but also at the much larger watershed level. This is an important issue for salinas, as they are not usually considered a useful part of the watershed. In the case of inland salinas, however, they depend on the replenishment of groundwater, which will dissolve the salts in the soil and provide enough flow of brine. Also, the groundwater can be affected by the (excessive) use of fertilizers or pesticides in nearby agricultural fields, that may lixiviate to the water table below. If the groundwater levels are low or the water is polluted, this will affect the quantity and quality of the salt to be produced. No single inland salt making site in Spain is protected at watershed level and only a few are protected as wetlands (see Chapter 4).

[155] The EU funded projects ALAS (URL: http://www.aegean.gr/alas/general.htm), ECOSAL Atlantis (URL: http://ecosal-atlantis.ua.pt/), MC-Salt (URL: http://www.mc-salt.eu/en/index.html) and Mansalt (URL: http://www.kpss.si/en/the-park/park-tasks/project-work/life-mansalt) have produced documents specifying guidelines for the ecological management of salinas. These can be found in their respective websites, included between brackets.

Coastal sites face similar challenges with respect to the quantity and quality of the brine, but for different reasons. In Læsø, the saltworks controls the amount of brine to be used, so as not to deplete the brine deposits that take decades to fill. The site is protected as a whole, including the nearby deposits. In Guérande and Sečovlje, on the other hand, the brine is obtained from seawater, which may be polluted by common pollutants in the sea. So far, these pollutants are usually derived from nearby accidental or deliberate oil spills. However, future challenges will include the presence of microplastics in the water, a substance very hard to remove (Fendall & Sewell 2009).

Weather dependence is a key aspect for solar evaporation salinas. All studied sites suffer large fluctuations in the production of salt from year to year, because of changing weather patterns. As said before, dry winters and springs limit the amount of groundwater available to produce brine in inland sites, but a wet summer prevents the production of salt altogether. Summer storms may also spoil the harvest, if the salt is unprotected. Also relevant is the prevailing wind speed, direction and stability. Wind from the wrong direction may mean a lower evaporation rate; too weak winds may prevent the evaporated water from the brine to evacuate the area and halt the crystallization process; and too strong winds may disrupt proper crystallization. But perhaps the most relevant factor is the humidity of the air. To ensure evaporation and a good crystallization process, the air needs to be dry. Hence the factors such as air temperature, wind and water content of the air will need to combine in such a way that the evaporation rate is optimal. One the location of the salt making site has been determined, based on local geomorphology, topography, edaphology and climate, little else can be done to improve this. Hence, this is a weakness salt making sites must consider in their calculations.

Figure 8.1: A rainy day in Salinas de Oro, Navarra.
Rain can spoil the harvest of salt (©Katia Hueso)

Another issue is climate change. Bearing in mind that climate is defined as the average weather found in any given place, a permanent change in weather patterns may affect the salt making activity. The historical location of a salina is largely dependent on the climate prevailing in it and a change may be determinant for its fate on the long run.

Coastal sites, for instance, report sea-level rise (most probably induced by climate change) as a potential threat for their facilities. On the other hand, summer droughts may decrease the water table level in saline wetlands, thereby exposing the infrastructures –mostly built with clay– to weathering. Dykes and channels may dry up and suffer from general decay, fissures and other structural damages. Likewise, the higher risk in winter floods, especially in coastal salinas near estuaries, may also destroy infrastructures. Another climate change scenario is the increase in the frequency of extreme weather events, which in the Mediterranean may result in more windstill days or more abundant dust deposition from the Sahara, potentially affecting the quantity and quality of the salt obtained. In the Atlantic, the expected increase in summer precipitation, especially with respect to the intensity of the rainfall, will possibly prevent the harvest of salt (Adam 2002, de Castro *et al*. 2005, Kelemen *et al.* 2009, Williams 2002).

8.2.3 Economic constraints

The shift from producing "common salt", whether by hand or mechanised, to a high quality culinary salt is not only a technical one (improvement of collection methods, cleanliness of the salt, storage, packaging, marketing…). It is mainly a mental one: managers need to move from an industrial to a heritage paradigm. The salt, considered so far as a mineral, becomes a heritage asset. From selling the salt in a closed market with its key actors and rules (customers, distributors, prices), the salt as heritage becomes a complex product that incorporates not only is tangible values (the quality of the product itself) but also intangible ones (the tradition, the landscape). The latter are much more difficult to assess and to put a price tag on. It is the "added value" of the salt, but a very difficult one to interpret and explain to the customers[156]. Following the example of Guérande, many artisanal salt making sites have taken this step and are doing rather well (Sečovlje, Añana) while others are using the latter as examples for their own processes (other sites in the Adriatic, other inland sites in Spain). The main challenge is not only how to learn from the good practices and the mistakes these sites have committed, but also to find one's own identity.

Another issue of concern is not the inspiration, but the imitation of such salts. Given the success of hand-harvested salts, some industrial sites sell theirs with similar labels or sales strategies, or directly imitate the label itself[157]. Other malpractices include buying salt elsewhere and selling it with the wrong statement of origin, simply to keep up with the demand. The confusion with labels, the lack of information in them and the abuse of terms such as "natural", "organic", "bio" and the like, needs to be clarified to allow customers make an informed decision. Even when used legitimately, the customer has the difficult task to distinguish the truth behind attractive terms such as "Roman salt", "fossil salt" or "ice salt", to name a few (Figure 8.2).

The financial costs of recovering salt-related heritage is an issue of concern for all sites interested in offering their values to the public. Before 2008, when the global economic crisis struck, it was relatively easy to obtain funds and even political commitment to support heritage recovery projects. The most striking example in Spain is epitomised by the Master Plan of Salinas de Añana, which was valued in 20 million euro to be invested in a period of 20

[156] The latter only see that one kilogram of salt can be sold at 0,25 Euro or at 25 Euro, depending on the brand. While these huge differences –an increase in 10,000%!– are understandable on site, when visiting the salinas, they become more difficult to grasp in front of the supermarket shelf.

[157] In Slovenia, the box in which salt from Sečovlje is packaged, has been imitated by other salt making sites, stating it contains "sea salt" of undetermined origin, with a photo from the salinas of Sečovlje.

years. After roughly three quarters of this period have passed, the site is not yet self-sufficient. The huge investment made, imprecedent for a salina, also require large maintenance efforts. Over 2,000 salt making basins have been recovered, which need to be kept functional, regardless of the amount of salt produced and sold. Other infrastructures such as paths and brine baths need to be kept. Although Salinas de Añana has been the inspiration and perhaps also the envy of other sites, none have been able to obtain an equivalent political and financial support. This was viewed at some point with concern, but some of these sites are now in fact satisfied to operate with a less ambitious budget. This allows them to grow at a slower pace and provides them with a better adaptation capacity to a changing socio-economic environment.

Figure 8.2: Salt from the "Roman salinas" of Iptuci, in Cádiz (©Katia Hueso)

The slower pace also allows a closer relationship to the community, thereby strengthening the social fabric around the site. This is the case of Poza de la Sal or San Juan, for instance. On the other hand, certain sites are so much deteriorated, that a classical recovery project would need a powerful investment, which is virtually impossible to obtain nowadays. These sites will need to find more imaginative solutions for their heritage, from simply accepting the ruins to consolidating and reusing them for other purposes than salt making. This may be the case of Arcos de las Salinas or Espartinas.

The recovery of salt-related heritage will need, in any case, to lean on other heritage asset found in the area. The time of building a salt museum, with the additional sophistication of brine baths, has become obsolete. In Spain alone, 27 salt-themed museums and interpretation centres exist and half a dozen sites offer brine baths in different formats. In times of economic crisis, it is hard to justify a salt heritage recovery project with these ideas in mind. Salt making sites to be recovered need to find synergies with local assets that provide unique combinations of experience and identity for visitors and residents. Table 8.1 identifies possible or already existing synergies for the study sites, in combination to the main salt heritage values stressed by their stakeholders.

Table 8.1: Local identity through salt and synergies with other local assets

Site	Score	Stress on (axes)	(possible) synergies with
Spain			
Añana	90	Food, tourism	Rural tourism, local folklore
Poza	67	Tourism	Urban heritage, local folklore, performing arts
Rambla S.	64	Nature	Birdwatching, wellness
Gerri	55	Salt making	Adventure tourism, rural tourism, trekking
San Juan	54	Salt making	Geotourism, rural tourism
Imón	46	N/A	Rural heritage, architecture
Peralta	40	N/A	Religious heritage
Arcos	30	N/A	Stargazing, adventure tourism
Espartinas	22	N/A	Archaeological heritage
Rest of Europe			
Guérande	93	Food, culture	Birdwatching, gastronomy
Sečovlje	91	Food, health, nature	Urban heritage, beach tourism
Læsø	75	Food, health	Nature, active tourism, arts and crafts

Source: Own elaboration

8.1.4 Socio-cultural constraints

Productive salt making sites are usually steered by their owners and managers, who need to keep in mind administrative and legal regulations, but otherwise operate independently of other stakeholders in the area. This is for instance the case of those sites that have not yet undergone a proper recovery process, such as Espartinas, Arcos de las Salinas, Peralta de la Sal or Imón, for example. In these sites, owned by private companies or even individuals, the interest of stakeholders without the legal right to decide (land users, NGOs or even public authorities) is seen with a certain degree of suspicion; their participation in decision-making processes is barely welcome. However, saltscapes and salinas under patrimonialization processes become more diversified in which a combination of the primary –salt making– and tertiary activities –e.g. tourism– converge. In the management of such sites, many levels of stakeholders (local population, policy makers, owners, NGOs and even non-users, who value their plain existence) are involved and determining their degree of power or operating capacity is a complex matter (Schuyt & Brander 2004). This largely depends not only on the prevailing managerial culture in the area, but also on the quality and strength of individual and collective relations at local scale. In Salinas de Añana, for example, it took several years of negotiations between the owners of the salinas and the authorities –which later formed the *Fundación Valle Salado*– to come to an agreement. An agreement which, by the way, may need adjustment as the economic results of the salt making activity evolve with time. In Guérande, the *Cooperative Salines de Guérande* has managed to keep its original purpose of representing the interests of salt makers, in spite of having evolved from a combative to a corporate style of management. Keeping this complexity in mind, management measures should be planned in a broader spatial context and in a longer term than is usually the case, enhancing the coordination of multidisciplinary teams (Hueso & Carrasco 2008a).

The issue of ownership, hinted above, is crucial to understand the efficiency (or lack thereof) of the patrimonialization process. The smaller salt making sites belong to one single individual or family, as is the case of Salinas Espartinas or Arcos de las Salinas. This type of ownership allows fast decision making, but is in fact the weakest from the point of view of business making once the site has entered a phase of decline. Resources are scarce in all cases, but the capacity of accessing them becomes hard for private individuals. Most owners in this situation have an indifferent or even resignated attitude towards their sites. Many have been working here for generations and have witnessed or experienced first-hand the

hardships of the job. Now aged, probably pensioned, few have the mood and energy to initiate a patrimonialization process. At the most, they keep the activity ongoing on a "survival mode", that is, keeping the investments and costs at the minimum possible to obtain a product that is just good enough for the market.

On the other hand, precisely because of the effort they or their family has been forced to make to purchase the land, now feel reluctant to allow third parties in the management of their property. However, only those owners who decide to open up their business to other entities, may have a chance to obtain resources for the recovery of the site. This has not been the case in the sites cited above, although the owners of Arcos de las Salinas are aware of this flaw and are very slowly starting to seek alliances. However, personal and institutional relations are key to attain success and in isolated rural areas, these are usually polluted by past events, slowing down or even halting the process. A solution to this type of situation was recently found in the salinas of Rambla Salada. They also used to belong to a private individual, but were acquired by the regional government and the public use has been commissioned to the *Asociación La Carraca*. The combined efforts of the regional authority and this association allow a slow but efficient recovery process. Similarly, the salinas of San Juan were purchased by the municipality of Saelices de la Sal, who created a specific trust – *Fundación Naturaleza y Desarrollo*– to take care of their management. Public support to this foundation has been modest, yet enough to get the recovery process going. Despite being a slow process, the salina has managed to operate again.

Figure 8.3: A no trespassing sign in Salinas de Imón (©Katia Hueso)

In other cases, the site as a whole belongs to a group of people, who in turn own specific portions of the salt making units (usually the reservoirs and crystallizers) and also owned the corresponding rights to use the brine. These people may or not be the ones actually obtaining the salt, although in origin most of them were salt farmers. In some cases, a certain degree of organization existed, in the form of a "Community of Heirs" or similar structure. This was the situation in Poza de la Sal, Salinas de Añana or Gerri de la Sal. It used to be the case of Peralta de la Sal, too, but it was purchased by one single family in the 1980s. Again in this case, the present owners are hardly interested in the recovery of the site and the interest of other institutions is seen with a certain degree of scepticism. The communities of heirs of the sites mentioned above, on the other hand, have seen different degrees of organisation. In the cases of Poza de la Sal and Gerri de la Sal they have practically disappeared, and barely

exist on paper. This leads to a fragmentation of the interests of the different owners, who do not seem capable of finding a common view for the future of their site. But, on the other hand, the owners depend on each other to decide its fate. This is a serious limitation for the patrimonialization of their sites, as they need to reach a binding consensus that can ensure the provision of resources from other institutions. In any case, members of the communities of heirs have at least a strong sense of belonging to their sites. The motivation to recover the site can be enormous, as their childhood memories –of parents making salt; of themselves helping in this task; of shared hardship and joy– are still alive. On the other hand, they may also feel as the only authority capable of taking decisions, seeing other stakeholders as intruders in this realm of their past. Added to the old age of most of them, resulting in a combined lack of energy and scepticism, plus the emotional detachment of their descendants, who have never actually experienced the site, usually results in a paralysation of recovery efforts.

In Gerri de la Sal, this combined effect has resulted in the frustration of the individual efforts by one owner to recover the site. Although he is still capable of producing salt at a very small scale, there is a limit to what one single person can do at operational scale. It should be noted that this owner was not an original member of the community, but purchased the site relatively recently. This may have contributed to the lack of interest of others. In Poza de la Sal, the traces of some of the members of the community of heirs were lost and others were simply not interested. However, the municipality managed to purchase one functional salt making unit, the *Granja de Rusalado*, and has commissioned its recovery to the *Asociación de Amigos de las Salinas de Poza*. This has allowed to by-pass the issue of ownership, at least in this sector, and the results of their efforts are bearing their fruits. However, the Community of Heirs in Salinas de Añana was still in full charge of the site when recovery efforts started. Given the old-fashioned legal nature of this structure, it was decided to transform it into a private company and owners became shareholders. In order to attain resources, new shareholders were welcomed a fact that has been criticized by some of the old ones, but it is clear that this new structures has improved and sped up the decision-making process.

A peculiar case of ownership is the salinas de Imón y de la Olmeda, which are owned by a condominium of independent shareholders, who do not own physical portions of the site, but percentages of it. Although now an obsolete legal structure, at the time, this was a solution that forced consensus and prevented the fragmentation of the site with successive inheritance partitions. Also, none of the owners were or have ever been salt makers, and therefore kept a cool vision on the business of salt making. Hence, once the site entered in irreversible decline, the easiest solution was to sell their percentages to whoever made a reasonable offer. An opportunity arose when a company specialised in renewable energies, planning to speculate with public subsidies, decided to purchase most available shares. Which it id, leaving only an insignificant percentage of the company in the hands of a few individuals who refused to sell. This project failed and this company -using a series of complex business alliances- passed the site on to a *ad hoc* consortium of salt-related companies. They now try to exploit the brine for industrial salt making in a nearby field built on purpose, leaving the old salt making site abandoned. Officially, the owner of the site is still this condominium, but in fact decisions are made by the consortium. The few individual owners remaining have such a small percentage of the site, that nor their voice or their vote is relevant.

The salinas in Sečovlje have evolved from a collective ownership by salt makers, to a state-owned company that threatened to run the site with industrial criteria, to a small company dependent on a state-owned telecommunications giant. This has happened in just a few decades, with the background of geopolitical instability in the region. Managing a shifting

situation like this has been far from easy, but there seems to be a certain stability today. However, the relation to the actual salt workers is that of subcontractors, and there is a certain distance between the decision-making level and the day-to-day working level. Similarly, the salinas of Guérande were traditionally owned by individual salt makers, two-thirds of which have joined in the cooperative *Le Guérandais*. This model has proven to be very successful from the point of view of management, as the salt makers keep the power of decision on their property, but benefit from collective experience and action[158]. A few salt makers in the area, however, have preferred to stay independent and perform the management of their sites by themselves. The situation in Læsø is rather different, as it does not have to cope with historical issues, as all the other cases mentioned here. The owner of the saltworks is a private company, which has employed the salt workers. The management and relation to the workers is quite transparent, but perhaps the latter lack the weight of History. They have a fresh, but pragmatic view of their tasks and do not feel as strong an identity as other salt workers do.

Besides the issue of legal ownership, heritage management should consider other type of "owners", that is, stakeholders with an interest in the site. These can be land users such as birdwatchers, hunters, sportspeople, visitors, etc. It has been hinted above how difficult it is to strike a balance among their different views and priorities. In some cases, the sites are (partially) owned or managed by public bodies (Rambla Salada, Poza de la Sal, Salinas de Añana, San Juan), but other stakeholders are barely invited to participate in the decision-making process. They must accept to consider themselves represented by the public institutions taking part in the ownership structures. Or, as it happens in the cases of Poza de la Sal and Rambla Salada, one specific stakeholder has been commissioned for the management of the site.

Without the need to belong to any interest group, the local community can be divided according to their historical family relations to the site. Long-term residents have traditionally held the power to decide the fate of their community, even more so in small rural settlements. But the arrival of new types of residents are slowly changing this worldview. Permanent residents with a long family history in any given area may have difficulties to acknowledge the right of other residents to belong and, therefore, to provide an opinion on their shared heritage. On the other hand, the latter feel their sense of belonging must be validated before "using" it. The priorities of each group may differ: long-term locals tend to prefer the to keep the status quo and have a conservative or even fatalistic view on the fate of their heritage, while new residents[159] (a.k.a. neo-rurals) and summer dwellers are particularly sensitive to it. It is usually one of the reasons they have moved to that area, and -given their life experience elsewhere- feel they can provide fresh ideas to improve or recover it, and even to provide a new livelihood from it. New residents may experience a certain feeling of disdain from members of the established community, who in turn may see the first as opportunists. It is therefore essential to provide opportunities for dialogue and common understanding, both between these groups and between different generations. The stronger salt heritage recovery projects studied here have spent considerable efforts in creating links between and among the local community: In Salinas de Añana, the

[158] Similar structures exist overseas, too. The Colima salt makers' cooperative in Mexico has been functioning during 90 years, constituting an interesting case of an organisation that has been managed to defend the rights of the workers, despite the numerous socio-political changes occurring in the region during this period (Gaytán & Orozco 2015).

[159] Immigrants, also commonly found in rural areas, are also new residents, but tend to lead a life away from the community. They tend to integrate more for professional purposes, and therefore stay away from this debate.

management style shifted from a technical supervision of the rehabilitation of the site to an integrated recovery project more focused on the link between the salt making activity and the local community. The sense of belonging of residents has certainly benefitted from this approach. Likewise, the *Asociación de Amigos de las Salinas de Poza*, strongly focuses on participation of residents in all its activities, often leaning on volunteer work. Residents now feel proud of their salinas being active again and happily make turns in them to produce their own salt[160]. This is clearly an unsolved issue in the some of the other Spanish study sites, such as Gerri de la Sal, Imón, Peralta de la Sal, Arcos de las Salinas o Espartinas.

8.2.5 SWOT analysis of salt heritage and saltscapes

In order to understand the current situation of artisanal salinas and how they face the future, a SWOT diagram can help. This is a tool originally used for corporate analysis, but now often employed to analyse the potential performance of organisations, projects, etc., in order to summarize their main positive and negative aspects. Within the context of artisanal salt making areas, the items "strengths" and "weaknesses" refer to the intrinsic aspects of the sites; whereas the items "opportunities" and "threats" are related to their sociocultural and business environment. In Table 8.2 a SWOT diagram of the sites is presented, dividing the intrinsic categories into those that are structural and managerial. From this point of view, two main categories can be distinguished, namely structural and managerial features. The first refer to intrinsic characteristics of this type of sites, regardless of size, location, state of conservation and sociocultural background. The latter are those that are a consequence of management decisions at any given level. These features are common for most (former) salt making sites and are, necessarily, very generic. However, they may provide hints as to what management model may suit best. Table 8.2 summarizes the strengths, weaknesses, opportunities and threats saltscapes and salt heritage face.

From the point of view of the structural strengths, as compared with other productive activities, salt is a well-known commodity that may trigger the interest of a broad sector of the public. The landscapes providing a harmonious and serene combination of natural and artificial elements, in which water is protagonist. The apparent simplicity of the structure of these landscapes allows easy reading and understanding, especially if there are recent remains of the activity. A visit to a salina may in fact provide a profound aesthetic impact, given the combination of human-made structures and unfamiliar nature due to the presence of salt, especially in inland sites, where such landscapes are even more unexpected (Gobster *et al*. 2007). Since these sites have been traditionally isolated, they have not often been visited. The public who seeks new, rewarding sensorial experiences, can find this in (former) salt making sites.

Saltscapes are usually located on rural areas, which are experiencing an ever-growing appreciation of their culture, as a token of authenticity and return to one's roots. The local community, on the other hand, has a stronger pride in their traditions, practices and products, with a stronger sense of belonging to the area. This pride makes them feel more empowered to steer the fate of their heritage. Also, the public demands a deeper knowledge on production processes, methods and materials, whether for food, housing or other commodities. Salt has the advantage of being a universal, everyday item. Besides from its culinary use or its well-known domestic applications, salt has an added allure for its symbolic

[160] The journal *El Alfolí* has published interviews with residents and salt masters of Poza de la Sal and Añana. This sense of pride is clearly visible in their replies (*El Alfolí* 17/2015: 20-22 and *El Alfolí* 19/2016: 15-18, URL: https://upco.academia.edu/KatiaHueso/El-Alfol%C3%AD [Retrieved in November 2016])

value, well represented in any kind of cultural manifestation (music, literature, art, religion…). It is therefore relatively easy to raise the interest of the public in it. In most cases, the remains of the salt making activity are still visible and can be recovered. This is translated in a potential for the development of rural tourism in new rural areas, with a scenic beauty somewhat away from the usual stereotypes.

There are numerous protection and planning instruments available that can be applied to the management of these sites. Given the multifunctionality of saltscapes, the variety of instruments is one of the largest possible. All this will also increase the chances to obtain public investments, although the global economic crisis is hitting hard, especially in the socio-cultural and environmental sectors. In addition, productive landscapes -especially those in which labour was hard- tend to generate strong feelings of identity and belonging. This idea is usually associated to industrial and mining landscapes, categories to which saltscapes also belong (Ruiz & Hernández 2007). But perhaps the strongest and most peculiar strength of saltscapes is that they can be recovered for the original purpose they were made. This is not common in former industrial or mining sites and happens only occasionally in certain rural activities such as bakeries, lime kilns or charcoal-from-biomass.

Table 8.2: SWOT analysis of salt heritage and saltscapes

Strengths	**Weaknesses**
Structural - Salt as a universally known commodity - Scenic beauty of saltscapes - Visible remains of the salt making activity - Appreciation of rural life *Managerial* - Planning and protection instruments - Attractive for public investments - Sense of belonging - Can be recovered to original function	*Structural* - Isolated geographical location - Decay and fragility of salt heritage - Salt making as a physical challenging activity - Seasonality - Costly recovery and maintenance *Managerial* - Lack of support for artisanal salt as a product - Conflicts in the uses of saltscapes - Vandalism
Opportunities	**Threats**
Managerial - Development of sustainable tourism around saltscapes - Potential innovative uses (also R&D) - Synergies with other heritage assets and activities - Empowerment and motivation of the local community around heritage - Flexible financing mechanisms	*Managerial* - Low population density - Global economic crisis - Plans and projects beyond the scope of control - Political shortsightedness - Dependence on public funds - Lack of entrepreneurial culture - Climate change

Source: Own elaboration

The main structural weaknesses of saltscapes have to do with location and technology. Salt can only be made where certain geological, climatic and topographical conditions exist. In the case of inland salinas, this is usually a rather isolated spot, in which the conditions for the development of agricultural are far from ideal; at the coast, the sheer presence of the salinas has prevented further development and urban areas are found at some distance. Salt making itself is a strenuous activity that requires young, fit and motivated workforce. Bearing in mind that salt can only be harvested a couple of months per year, salt workers need to combine

this job with other activities. Given the isolation and poor soils found in these areas, they are less attractive sites for settlement. Due to a strong depopulation of rural areas in Europe, these have an even lower population density and the residents that still remain in the area are usually aged and therefore, the skills needed to maintain the activity alive are gradually getting lost. The maintenance of salinas is also demanding, especially those that had some importance in the past, which host more complex devices, a larger productive surface, plus housing, offices and several storage buildings. The materials used for building the salt making devices and infrastructures are usually obtained from the surrounding terrain and decay rapidly once in disuse. Being essentially flat infrastructures, as soon as decay sets in, falling into a ruined state happens within a decade or so[161]. Therefore, these sites are especially vulnerable to climate change (Adam 2002). Delays in planning and performing recovery activity rapidly increase the costs, and maintenance after that is very costly in terms of manpower. In case the salt making activity can be continued or resumed, it must be considered that it is a physically demanding activity few people are ready to undertake. The seasonality further contributes to the weather dependence, which results in irregular income, forcing salt makers to seek their livelihood from other activities; while being very intensively engaged during the salt harvesting season.

From the point of view of management, salt making is not a priority activity for authorities and institutions that may provide (financial) support, such as rural development agencies or chambers of commerce. The little institutional willingness to invest in these facilities is usually aggravated when the sites are in private hands. Planning and implementing recovery projects in these sites is costly and the global economic crisis has significantly decreased the funding opportunities for the upkeep and rehabilitation of rural heritage, both from public as from private bodies. There is still a strong culture of dependence on public subsidies, which has been cultivated by the successive CAP programmes. A combination of relative old age and a limited entrepreneurial capacity, makes these rural areas especially vulnerable.

In abandoned saltscapes it is common to find many other users of the land, with consolidated rights such as hunters, recreationists or even farmers. These conflicts, especially in rural areas, are deeply rooted in the collective psyche and hard to solve. In some cases, unauthorised users of the site are disrespectful and loot the property or destroy infrastructure.

Nevertheless, the increasing sensitivity towards sustainable tourism initiatives may benefit tourism around saltscapes, as the sites lend themselves well to a slow, conscious, experience-based form of tourism (Wu *et al.* 2015). There are also numerous potential uses of a saltscape that are compatible with the conservation of its natural, cultural and human values, as has been discussed in Chapter 7. They may even lend themselves to new economic activities around research, innovation and development. Although it is an expensive task, public funds are slowly being released again. There is also a growing flexibility in funding practices, that does not require strong investments. Also, authorities seem to be more open to transfer

[161] The main conceptual difference between "decay" and "ruin" is that the first can be recovered, whereas the second needs reconstruction, if at all. The line between them is subtle, yet it is a fast process. A salt making site that has been abandoned will enter in an irreversible state of ruin within a decade or two. After that, it blends with the landscape and may take a century or so to finally disappear. This has been clearly the case in Imón since my first visit in 1996, three years after abandonment. Today, 20 years later, the site would need major reconstruction. Narciso Padrones, president of the *Asociación de Amigos de las Salinas de Poza*, mentioned a similar timeframe in reference to his own experience in Poza de la Sal, during the Conference "*Historia de la* sal*: del* briquetage *a las primeras balsas de evaporación*" (Salt History: from *briquetage* to the first evaporation basins), celebrated in Ciempozuelos on November 18th, 2016.

tasks to private organisations, e.g. with land stewardship agreements, volunteer work, etc., making the sites' management more flexible. This enhanced flexibility is also perceived in society in general, with a growing diversity of products and services, where the traditional dichotomies client-customer, resident-visitor or student-teacher, to name a few, are becoming blurred. Also, synergies with other heritage assets or like-minded initiatives in the area can be found. The diversification of activities increases the opportunities of participation for the local community, thereby empowering them around their heritage. All this may create unimaginable synergies and collaborations that may provide new opportunities for heritage to (re-) emerge. Hence, despite the gloomy economic scenario, it may become an opportunity rather than a threat. Some of these new, positive practices will be detailed below.

The rest of the threats faced by saltscapes and salt heritage are similar to their weaknesses. The salt making sites, given their isolated location, lie in areas with low population density and with ageing groups, less capable of mobilising the technical skills needed to undertake an integrated recovery project. The area will then depend on external institutions, which may debilitate empowerment process of the local community. In addition, small scale projects will be vulnerable to larger plans and programmes that affect the region, which may be detrimental for their own purposes (e.g. building infrastructures[162]). This bears relation to the political shortsightedness of the average politician, who does not dare to plan beyond his or her four years in office. Decision levels well below the powerful ones are seriously affected by this, as by the time a final decision trickles down, precious months have passed. Also, rural areas in Europe have learnt to depend on public subsidies and suffer from a structural lack of initiative and entrepreneurial culture. The few daring entrepreneurs have thus difficulties to overcome scepticism and fatalism.

8.3 Analysis of the patrimonialization of salt heritage– from the business of salt to the business of heritage

This section will offer a description of the different stages of the patrimonialization process based on the experience of the study sites, although examples of other sites will be provided when appropriate. The three main stages are "before patrimonialization/site in decline", that is, the situation where the interest in heritage is just sprouting; "patrimonialization process in progress", which occurs when there is a general will to protect and recover the heritage values of the site, but efforts are not fully coordinated yet; and "consolidated patrimonialization process", which is when the site is virtually self-sufficient in terms of management and resources. This process has had common features in the different locations and may coincide with similar heritage-based saltscapes and salt making sites. Table 8.3 summarises the features of each of these stages, according to different criteria.

Figure 8.4 offers a visual representation of the three stages and the situation of each of the study sites according to their score and narrative. This graph does not represent a linear progression, but rather a picture of the situation today. However, certain results are worth commenting. As has been discussed in previous chapters, some of the sites have been abandoned or declined directly from a situation of artisanal salt making, whereas others have

[162] This has been the case with the wind farm near Poza de la Sal, which finally was moved a couple of kilometres away, or the new road being built in Gerri de la Sal, in which allegations against the potential harmful effect on the salinas have been dismissed.

tried to upgrade their scale of production to an industrial mode of salt making. These are the sites that are now fully in private hands (Imón, Peralta, Arcos and Espartinas). Perhaps due to this transformation and the incapacity or lack of interest of the owners in investing in heritage, these are the sites with the lowest scores (below 50/100). In the other sites, there has not been a transformation of the infrastructure, but only a decline that can more easily be reverted. On the other hand, the ownership structure has allowed the establishment of private-public partnerships to initiate the patrimonialization process. The sites with institutions exclusively devoted to the exploitation of the heritage values have a score of 75/100 or more and are considered as consolidated.

Table 8.3: Main features of the different stages of the patrimonialization process: from the business of salt to the business of heritage

Criterion	Before patrimonialization	Patrimonialization process	
		In progress	Consolidated
Type of activity	Extractive	Mixed	Heritage
Scope of the activity	Site-specific	Site-specific	Local-regional
Type of landscape	Productive	Of ethnographical interest	Cultural
State of heritage	Abandoned / in decline	Under recovery	Basically recovered, need maintenance
Main caretaker	Owner (individual or SME)	Local community or administration	*Ad hoc* institution (public or private)
Other stakeholders	Salt workers Public administration	Funding bodies	Workers Local community Visitors NGOs / academia Society in general
Funding	By owner	Mainly external, but scattered	High degree of self sufficiency
Products & services	Salt Brine Other minerals	Salt & sub-products Heritage Landscape	Salt, subproducts and halobiota (as a basis for food-wellness-tourism) Nature & culture
Visibility of the site	Business environment Local community	Specialists Authorities	Society in general
Main features of this stage	Decline Abandonment Activism	Activation of heritage elements Volunteerism	Professionalization Alienation?
Sites	Imón Peralta de la Sal Arcos de las Salinas Espartinas	San Juan Rambla Salada Gerri de la Sal Poza de la Sal	Guérande Sečovlje Læsø Salinas de Añana

Source: Own elaboration

In Figure 8.4, the trend of the sites cannot be seen. Based on the information obtained about the progress on the last few years, it is worth noting that the sites with a patrimonialization process in progress show an upward trend, that is, towards improvement of the present-day situation. However, the sites in decline seem to have difficulties moving towards more advances stages of patrimonialization or may even be progressing towards further decline, as is currently occurring in Imón. In some sites (Peralta, Arcos, Espartinas), there have been repeated trials to unblock the situation, whether steered by NGOs or public administrations, although these are too young and weak to draw any conclusions so far. In any case, there seems to be threshold in the process that is hard to overcome. Possible interpretations are offered below, where the different stages are explained in some detail.

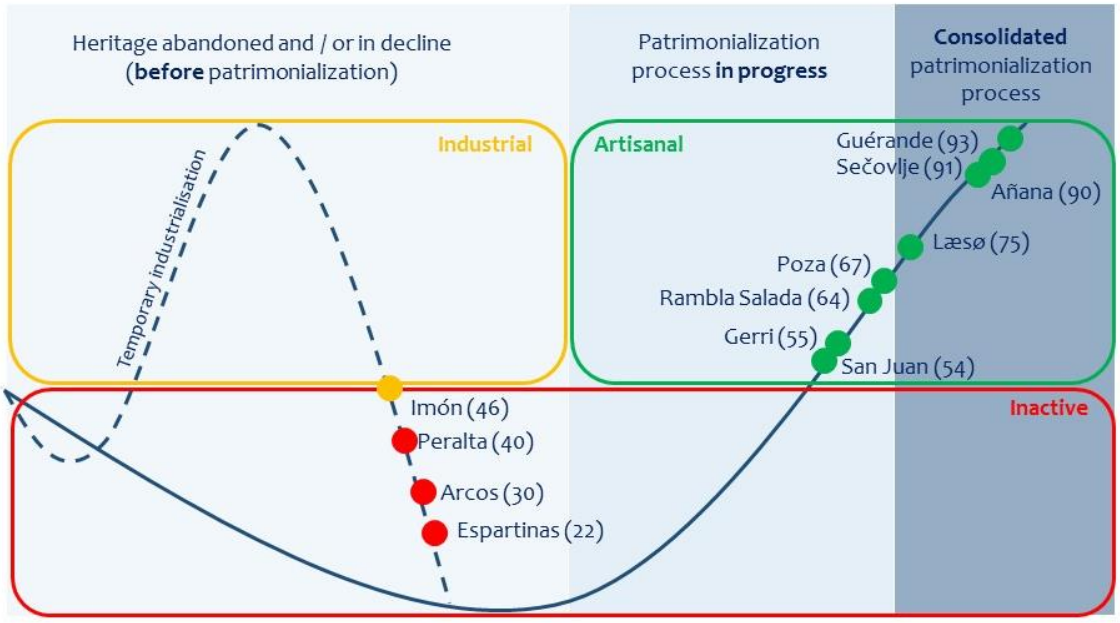


Figure 8.4: Patrimonialization stages, scale of salt making activity and current situation of the sites (score between brackets) (Source: Own elaboration)

8.3.1 Before patrimonialization

Although each salt making site has undergone or is in the process of undergoing its own heritage development, there are certain features in common amongst them. These processes can be considered a continuum, ranging from a site strictly devoted to the production of salt to a site devoted to the dissemination of heritage values. However, several discrete phases can be distinguished in the process: before patrimonialization; heritage recovery in progress and consolidated heritage recovery. Table 8.3 and Figure 8.1 provide a description of the typical features of a salt making site in its three main phases, respectively a view of the process in each of the study sites. Typically, these will start from a situation of decline or even abandonment of a formerly thriving salt making site. At this stage, the activity is merely an extractive one, that used to be hand-made before the advent of industrialization, but gradually became mechanised during the 20th century. The productive activity bears little relation to its hinterland, except perhaps for the historical relations to institutions of power, at the times salt was considered equivalent to gold (well before industrialisation). These links are now broken, although historical buildings such as fortresses, palaces, fortified walls or monasteries, are still witness of them. The productive activity is, in the late 20th century, thus detached from these links and the origin of its customers and suppliers (even of manual workers) are market-driven, and need not bear any relation to the location of the site. The drivers of the business are defined by the owner, who in turn must keep to the legal regulations established by the different sectorial and domestic levels of public authority. The products and services offered are, at this stage, all related to the natural resources exploited: salt, brine and/or mother lay. If the site receives any funding, it is provided by the owners to cover the costs of (a minimum) maintenance and is never seen as an investment for the future, but rather a requisite to be able to continue producing. If the cost to be covered is too high, the abandonment of the site may be the final decision. At this stage, few people are aware of the site, except its business environment, if at all, plus a few individuals with an interest in heritage.

In times of global economy, the scale of production is key to stay competitive, especially with respect to a low-value commodity as common salt. Few industrial salt making sites in the world are in the position to compete and most of them have survived thanks to alliances, mergers and acquisitions. For many medium- and small-sized, often family-owned SMEs, this competition has been impossible to overcome. The business of salt has become the activity of a few large companies. Smaller salt making sites have had to adapt. In some cases, this has been done by changing the use of the land for other purposes (agriculture, aquaculture or tourism infrastructures), hence altering the original purpose of the site and thereby modifying the landscape and its built heritage; not to mention the loss of the professional know-how and traditions of salt making. In most cases, especially for those sites found inland in Spain, the activity has simply been abandoned, with similar side-effects for their heritage. In certain situations of decline, owners of small salt making sites have tried to avoid abandonment by industrialising the activity. They have mechanised some parts of the process and have tried to enhance the productivity by different means (deepen the wells, enlarging the basins, cover their bottoms with dark plastic…). This has had little effect on the long run, resulting anyway in abandonment further down the line and in addition has had a destructive effect on heritage, as it has required the transformation of ancient infrastructures. This has been the case to a certain extent in Peralta de la Sal and, most dramatically, in Imón. Only a few individual salt makers have managed to survive by keeping it as a side activity, although the heritage has been neglected to the point of almost disappearing. None of the study sites has been in this situation, but can be observed in small salinas in Córdoba, Jaén, Cuenca… . At this point, a shift in business paradigm is needed: from the business of salt to that of heritage. According to the experiences offered here, it is far from straightforward.

The stage of decline and subsequent abandonment can last anything from a few years to centuries. It is obvious that the shorter the period of abandonment, the easier and faster the recovery of heritage can be. In some cases, the abandonment has been so prolonged that recovery into the original function of the site is no longer possible. At this stage, the owners have lost their energy and capacity to invest time, effort and resources into the site. It is most probable that they have also lost interest, and do not wish to be bothered about it, especially if they are the heirs and have never actually profited from it. Again, in longer periods of abandonment of the salt making activity, the owners may not be traceable anymore.

The awareness of the values of a given site is usually sparked by an individual or a small organisation interested in local history, heritage, culture or nature. This spark can be originated by multiple ways: the perseverance of one person, by the slow trickling of a societal trend or by the aftermath of an event[163]. The importance of the role of certain individuals should not be neglected, as they may have a strong inspirational power[164]. Whether they act out of nostalgia (e.g. former salt workers that feel their work still has some meaning) or out of a sensitivity to heritage (e.g. the want to preserve it by actually using it), they may counteract the general abandonment a site has suffered. However, the spark needs to be fuelled: without the support of their community or institutions, their efforts will prove to be futile.

[163] It can be a conference, the collapse of a building, the visit of a celebrity, a TV programme… It is very diverse and inpredictable.

[164] Or, as Peter Singers, president of *Læsø Marketing A/S*, put it: "rural areas need Poul Christensens". Mr. Christensen's inspirational power clearly percolated in an interview published in El Alfolí 20 (2017). URL: https://upco.academia.edu/KatiaHueso/El-Alfol%C3%AD [Retrieved January 2017].

But sometimes it works: At first, only like-minded people will become interested. Excursions, conferences, exhibits and other friendly events will be organised. Some will also try to agitate the public, report to the authorities in charge of cultural and natural heritage, call for demonstrations and seek attention from the press. Others, with the cooperation of external investors or funding bodies, will try to reach a business agreement with the owners, in which these normally lose their rights to the management of the site for one or two generations. This can be considered the very first stage of a patrimonialization process, but alas is a very fragile one. As a ball in the bottom of a rocking bowl, it needs to gain enough momentum to pass the threshold to the next one. But, more often than not, a former productive site stays stuck in it for many different reasons (lack of willingness, consensus or resources from the different stakeholders; political instability). There may be moments of hope, when a new project idea arises or a promise for financing seems more solid, but these alternate with moments of despair, in which nothing seems to work. This is the situation in some of the studied sites: Espartinas, Arcos de las Salinas, Peralta, Imón or perhaps even the salt making area of Gerri de la Sal.

This position of stagnation is pernicious for the site on the long run, as the individuals and organisations initially sparking the process are exhausted and fresh blood is needed to refresh it, not always easy to find in rural areas. In addition, most of these individuals sensitive to the preservation of heritage are residents not born in the area or are summer dwellers. Hence, they will lack the support of the local community. Key to a strong recovery movement is the implication of the local community and the commitment of long-term residents. To this end, residents who have travelled and seen other ways of dealing with heritage may act as a useful hinge, promoting a common understanding between these groups. Also, businesspeople wanting to recover a site should have the local community at their side, as the heritage is perceived as a communal possession.

8.3.2 Patrimonialization process in progress

Occasionally, the process gains momentum and a new stage is reached. There is an activation of the heritage elements, by which they now belong to the community rather to one single owner. The feeling of identity and belonging has been triggered. At this stage, there is a certain confusion among stakeholders, it is not always clear who leads the process and decision-making processes are complex. There is a succession of actions that contribute to the recovery of heritage, but coordination and long-term strategy may be still missing. The provision of resources, especially financial ones, is irregular. These depend on opportunities that arise irregularly and the amounts are variable, but often modest, a factor that created a mismatch between the availability of technical and human resources, as well as the willingness to act, and the actual capacity to do so. Seen from outside, the site bears some ethnographical interest but has a weak heritage narrative and may lack supporting infrastructures for visitors. Hence, it is a period of certain incertitude, still unstable and with a risk of being reversible. But at this stage, the patrimonialization process is ongoing and can be considered in progress (see also Table 8.3 and Figure 8.1). This is the case of Gerri de la Sal, with the recovery of its salt warehouse; Rambla Salada or salinas de San Juan.

Once in progress, the patrimonialization process requires a roadmap, an organization chart, a long-term strategy and the commitment of stakeholders. The site is gaining visibility among public authorities and the local community (re-)gains interest. Skilled workforce, technical know-how and financial resources are needed. The organisations and individual who have sparked the process are usually incapable of taking full charge of the recovery of heritage

under these premises. The local community, even if reaching a full consensus, will also need to outsource these skills. Hence, a patrimonialization process can be considered consolidated when these requirements are met. If the shift on paradigm results in the former salt making site being a heritage site, then a heritage-based institution should be in full charge of it. At this point, it is not relevant whether this institution is public or private, profit or non-profit, community-driven or not. The idea is that it should be exclusively focused on the recovery and dissemination of the heritage of the site. This is the case of the *Fundación Valle Salado* (public-private, non-profit trust) in Salinas de Añana; the *Soline Pridelava d.o.o.* (private, for profit company) in Sečovlje; *Læsø Salt* A/S (private, for profit company) in Læsø, or the *Cooperative Le Guérandais* (private, cooperative) in Guérande. Aside from these institutions, devoted exclusively to the patrimonialization of the site, there are management plans, strategies and similar documents establishing medium- and long-term objectives; trained staff and a commitment of stakeholders for the financial or political support to their activity.

Similar institutions are operating elsewhere too. Examples are the *Fundación Naturaleza y Desarrollo* in salinas de San Juan; the *Asociación de Amigos de las Salinas de Poza* in Poza de la Sal, or the *Asociación La Carraca* in Rambla Salada. However, these structures are still too dependent on volunteerism (especially the latter two) and the commitment of more powerful stakeholders for strategic and financial stability (the three of them). Also, the three of them lack (skilled) staff and are fully dependent on external resources. Hence, these cases cannot yet be considered consolidated, but with their patrimonialization process in progress, albeit pointing towards consolidation (see Figure 8.1).

8.3.3 Consolidated patrimonialization process

At this stage, the recovery and new uses of a salt making site are clearly based on its heritage rather than the industrial salt market. The main feature of this stage of the patrimonialization process is perhaps the fact that an institution created *ad hoc* is in full charge of the site and has a great degree of independence in its decision making and even its financing. This organization is led and run by professional employees, trained for the purpose. Stakeholders are more diverse, as they include the local community, visitors and even society in general, making the management of the site more complex. Thus are the products and services offered, being more diversified as previously. Besides from salt, the site can offer by products such as brine, mother lay, muds or elaborated products based on these. Services for visitors and the local community can be diverse, too, most of them are related to leisure and wellness.

The consolidated patrimonialization is far from being a static phase, nor is it a terminus station of the process. It is always evolving, constantly adapting to new situations and circumstances. The key is to keep the essence of the project stable, to preserve the identity of the site, while navigating the shifting waters of the relation with its hinterland and its stakeholders. A too rigid management may result in missing opportunities for financial and political support, while a swaying management style may result in a loss of identity and support from the local community. Some of the study sites have suffered these situations prior to consolidating.

The risk of having a heritage recovery project led by one single institution is the alienation from the original purpose of the spark that triggered it. Also, workers from managing institutions often come from other areas and do not feel such a strong sense of belonging to the site. Theirs is just a job, not a part of their own personal heritage. A common criticism

heard from community leaders and scholars (e.g. in Salinas de Añana or Guérande) is the gradual shift away from the heritage aspects and the stronger stress on business. No one discusses the need to raise funds to preserve heritage, even making profit on certain activities to cover the costs of those making losses. However, the initial purpose to recover heritage for the purpose of the preservation of a certain activity or landscape is becoming a business activity that simply delves on a heritage narrative.

An important factor in the consolidation of a patrimonialization process is the fact that the site has had a historical relationship to salt. The knowledge of this link, especially if it has been experienced by living generations, provides a strong motivation to recover heritage and to collaborate in efforts promoted by others. The local community feels a sense of a shared identity and feels empowered by it. Even in the case of Læsø, where this link has been disrupted for several centuries, the historical relevance of salt has been strong enough to create a sense of pride and identity among the islanders. If this identity is missing, such as the case of newly built salt seething facilities in Nordic countries or in the UK, the sense of belonging and willingness to cooperate will be much weaker. The "good story", as saltmaster Poul Christensen says, will thus be missing.

Having said this, a distinct feature of consolidated patrimonialization processes is that these are living landscapes and living heritage. They are not a "live museum, but they are simply alive" (Goldas Buron, pers. comm.). Whether they choose to offer a museum to the public or not (Guérande and Sečovlje do; Añana and Læsø, do not), the stress is on the salt making activity. The museum only provides a background information for those willing to deepen in the subject, but it is not the centrepiece of the discourse of the site. The sense of pride and belonging of the local community stems from the salt making activity and, perhaps, on the landscape it has created. The museum is a resource, not a *raison d'être*.

Another point of attention should be the risk of superficial imitation. Sites at the start of the patrimonialization process tend to be blinded by the consolidated examples. They may wish to follow the same steps and pursue the same goals, regardless of the different contexts in which these processes take place. One can of course be inspired by another, just like Guérande has inspired Salinas de Añana or Sečovlje, who in turn serve as inspiration to other inland salinas in Spain, or other salt making sites in the Adriatic, respectively[165]. But sites yet to be patrimonialized should find their own ways and means to do so, according to their situation, to their values and the strengths and opportunities they have, which will act in favour of their own individual process, rather than forcing situations that may not be feasible. In the next sections, some distilled ideas for the management of patrimonialization processes will be offered.

This contextualization should not only be based on location but also on time. The patrimonialization of artisanal salt making may give the impression of needing to keep the salt making techniques fossilized in time. However, consolidated sites have been able to adapt the salt making techniques to the modern needs of their customers (e.g. quality standards, diversified products) and workers (e.g. ergonomy, improvement of materials) while preserving the spirit of the local salt making culture. These sites have followed a learning process, by which the lessons from old salt masters have been respected in spirit

[165] At least, solar evaporation salinas can more easily offer a unique combination of natural and cultural assets. Salt mines in decline are now imitating the business example of Himalaya pink salt, without any heritage narrative attached to it and hence all looking the same. This is not only harmful for heritage itself, as it is being ignored, but also for the businesses themselves, too, as they compete rather than cooperate with each other.

and form, but new salt makers feel empowered enough to innovate safely within the limits of the identity of the site. As anthropologist Geneviève Delbos stated (FMA 2007, p. 45), this can only happen once the site has undergone a full patrimonialization process and has reached a renewed adulthood[166].

Inspired or not by these cases, there are other possibly consolidated patrimonialization processes that deserve attention. In them, there has been a combined and coordinated effort to protect the natural and cultural heritage of salt and the revival of the artisanal salt making activity, albeit at a different scale of patrimonialization. These are the Ria de Aveiro, In Portugal, including the combined recovery actions by the University of Aveiro in Santiago da Fonte and the Ecomuseu de Marina da Troncalhada run by the municipality (Bastos 2009, Cardoso 2005, Cardoso & Ferreira 2008, Ferreira 2010, Lillebø *et al.* 2011, Rodrigues *et al*. 2011, Vieira & Bio 2014); and the Bay of Cádiz, in Spain, with the combined actions by the University of Cádiz, the Natural Park Bay of Cádiz and the Fundación Salarte, among others (Martín & Gómez 2015, Masero 2003, Ménanteau *et al.* 2001; *et al.* 2012, Rivero *et al.* 2015, Tros de Ilarduya 2014). Both have received strong institutional support, but the salt making companies or families are running their sites independently. Hence, a variety of commercial strategies exist and different degrees of interest in the heritage values of salt making are found, but both regions have managed to offer an integrated salt making identity, which is perceived both by the local community as by visitors. These sites are especially complex given their size, the diversity of stakeholders and the manifold uses of the territory, not always compatible with each other.

8.3.4 Other examples of (partial) patrimonialization

So far, the discussion above has implicitly assumed that the heritage recovery process transformed the sites from a "forced" artisanal salt making model to a "facultative" or "multifunctional" artisanal model[167]. That is, salt making has always stayed central. This is in fact one of the strengths of a salina: it can be recovered for original purpose it was built for. This is hardly the case with other types of, for example, industrial heritage and therefore an important asset. But some sites are thus deteriorated that the recovery of the salt making circuit is deemed inviable. This does not mean the site is not worth recovering or that its heritage, of whatever nature, is not worth preserving. One of the study sites, salinas de Espartinas, cannot be recovered due to the state of the brine source and the evaporation basins. Similarly, it seems utopian to think that the salinas of Arcos or Peralta can be fully recovered, given the state of the infrastructure. The dissemination of salt making heritage and the promotion of its associated identity should still be possible. In this sense, it may be useful to look at examples beyond salinas. Numerous former mining sites, although not productive anymore, have been prepared for visitors (Cole 2004, Conllin & Jolliffe 2010, Pretes 2002). Others have been converted into venues for cultural activities or as examples of Land Art. Examples of the latter are the association *Lithica*, which has transformed a stone quarry in Menorca (Balearic Islands, Spain) into one big work of art or the mining district of

[166] When she said this, she put Guérande as an example of mature patrimonialization, whereas Salinas de Añana, in her view, had not reached this stage. Today, a decade later, Salinas de Añana can probably be considered mature form this respect, too.

[167] A *forced* artisanal means that there was no choice with respect to the method used. This was the case in most smaller salt making sites up to their abandonment, as industrialisation was not feasible. A *facultative* artisanal model is one that leaves the choice to the manager. This is the case of larger salt making sites, in which part or all of it is devoted to the hand harvesting of salt. A *multifunctional* artisanal model means that other compatible activities are possible on site.

Ojos Negros (Teruel, Spain) (Arribas 2016). Former industrial sites have become the ideal places for experience-based tourism or leisure[168]. The challenge is how to keep the public interested in the heritage aspects and not only in the complementary products and services they may offer[169].

Certain patrimonialization processes may give the impression of being consolidated, due to their apparent success or the resources that have been invested. This is often the case of salt mines, such as *Salzwelten* in Austria or the *Parc Cultural de la Sal* in Cardona. However, these sites lack the vision towards the future that can be perceived in solar evaporation sites, where salt production is still possible. Former mining and industrial sites cannot produce salt anymore or, if they do, need to separate this activity from the public, for safety reasons. Hence, the message that comes across is that of a past activity and the current relevance of this activity for the local community or the landscape is missing in their story. At the most, there will be a nostalgic discourse that sometimes seems a bit forced, given the living and working conditions that probably have been experienced at the site. A consolidated patrimonialization process also needs to stress the impact on their activity on the livelihood of the local community and the conservation of heritage and landscape values. If they do not or they cannot do so, these may be considered as partial consolidated processes.

On the other hand, many saltscapes with a natural protected area status have a certain degree of patrimonialization, but this is often only oriented towards tourism rather than the multifunctional use of built or intangible salt making heritage. In some locations, the site also produces artisanal salt by traditional methods, and the salt is offered with these criteria. This is the case of Es Trenc, in Mallorca (Balearic Islands), Cervia in Italy or Nin in Croatia (Bosna & Miletić 2016, Magnani 2015). These sites are not to be confused with industrial sites which have only a partial production of hand harvested salt (e.g. Camargue, in France) or use labels referring to their location in a natural protected area (e.g. Torrevieja, Cabo de Gata, San Pedro del Pinatar and Santa Pola in Spain). The latter are simply marketing strategies. Despite being natural protected areas with planning instruments regulating the activities inside the park, little attention is paid to their cultural heritage and the criteria for salt making, leaving this aspect over to the owner of the site (Tros de Ilarduya 2014).

Another case in point are saline lakes. Most European saline lakes are concentrated in Spain, Russia and Turkey. Several of them are protected and offer examples of patrimonialization via tourism and leisure, as hardly any of them produce salt. The best-known sites are Villafáfila (Zamora), Gallocanta (Teruel/Zaragoza) or Fuentedepiedra (Málaga) in Spain, in the Seewinkel area in Austria and Hungary or Tuz in Turkey (Demir 2014, Hueso & Carrasco 2009a). However, some of these lakes did produce salt in the past or still does (Lagunas de La Mancha in Toledo and Ciudad Real; Villafáfia; Bujaraloz in Zaragoza; Fuentedepiedra; Tuz…). Others had thermal baths built on their shores (Bujaraloz, Mediana and Chiprana in Zaragoza) or near brine sources (Carcaballana In Madrid, Belinchón in Cuenca, Las Salinas in Valladolid). Most of them are in disuse now. These are built and intangible heritage values on

[168] Care should be taken not to transform these industrial heritage sites in empty shells. There is a risk of losing the heritage essence and convert these sites in a fine piece of architectural heritage (of industrial origin, yes, but devoid of a proper narrative).

[169] A good example is the former salt mining district of Salzkammergut, in Austria. The company owning the salt mines, *Salinen Austria AG*, has a productive mine in Bad Ischl and three inactive sites, adapted for visitors: Hallein, Halstatt and Altaussee. The three of them show diverse aspects of the history of salt mining in this district, with varying degrees of depth, and are well complemented by the permanent exhibition at the *Keltenmuseum* in Hallein. Visitors are invited to see all of them, because the message will not repeat itself.

the verge of disappearing, as visitor centres in these sites tend to focus their attention towards the natural heritage.

At a more modest scale, there are a few small salt making sites that are run by families of small NGOs but are attaining a certain degree of success in the combined effort to protect their heritage and be self-sufficient. Apart from discrete subsidies, the sites function independently and rely upon their own resources. None of them have a major heritage recovery project, nor have they management plans or similar documents, but make an effort to disseminate their values to the public while selling hand-harvested salt. Examples of these are Salinas Biomaris (Huelva), Salinas de Oro (Navarra), Salí de Vilanova (Lleida) or Rio Maior (Portugal). Similar in size and organisation is Salinas de Iptuci (Cádiz), but this site received a one-million-euro investment for its recovery, thereby obtaining a good headstart with respect to others. Other small sites are run by the local authorities and have been able to attract stronger investments for the recovery of heritage and to build wellness infrastructures. This is the case of Salinar de Naval (Huesca) and Salí de Cambrils (Lleida), both of which offer leisure brine baths to their customers.

In these cases, the recovery of the heritage has been done without much support from scholars or specialists, but rather from their own vision of how it should be. Given the limited human, technical and financial resources, the results of the heritage protection and recovery are irregular.

At the other side of the spectrum, small primitive solar evaporation salinas are found throughout the Mediterranean. These have not followed a patrimonialization process, but there has not yet been a situation of decline. One could say they represent living heritage. Although these sites are located in remote, hard to access coastal areas, are indeed fragile due to the age of the salt makers and the lack of built heritage. The values of the site are mostly intangible and the gradual disappearance of salt harvesters make them very vulnerable. Examples of these locations are Croatia, Malta, Mani (Greece) or Bañaderos (Canaries) (Petanidou *et al.* 2002; Petanidou & Dalaka 2009).

8.3.5 Pending challenges in the patrimonialization of saltscapes

The consolidation of the patrimonialization process of salt heritage means that it has reached cruising altitude, but not necessarily its destination. The journey is still long and obstacles may arise. Given the youth of most processes studied -the oldest, Guérande, started a mere four decades ago-, work needs to be done in order to stabilise and strengthen the process. Here follow some examples of the challenges ahead. On the other hand, there is in fact no "destination" to reach, when speaking about patrimonialization. These processes are dynamic by nature. The uses of heritage evolve and so do the needs and the visions of people enjoying or managing it. Continuing with the metaphor of the journey, changes in course may take place and not all stakeholders may be happy with them. Therefore, I will end this section with some ethical considerations that have been arising during the processes under my scrutiny.

"Stronger together"

Any patrimonialization process is, as the word suggests, a changing situation, that needs to adapt to the present needs and predict future ones. So far, the processes described above have taken place isolated from each other. While some sites may inspire others (Guérande being the first and foremost), each site has found its own way. It seems sensible, that each site follows its own path, given the unique combination of features and factors that conform its heritage (use). However, a combined effort between sites, not only in exchanging experiences, but in really travelling this road together, may prove useful. Only in the past decade, several EU-funded projects have managed to gather different sites, but often, even in this case, the processes have been individual[170]. Transnational projects should be the ideal platform from which to create common strategies, to aid the weaker partners and to lobby for new policies and laws in favour of salt-related heritage.

The EU is stepping up the requirements for (and evidence of) mutual support and cooperation in such projects, and the quality of these partnerships is expected to improve. Other mechanisms such as networks, routes, partnerships, twinnings… may be useful to fully cooperate and share resources, knowledge and to obtain results faster.

Identity and sense of belonging

To this end, an important pending task in many a site is the strengthening of the identity and sense of belonging. In the early phases of patrimonialization, these feelings are normally buried deep into the psyche of the local community, who often prefers to forget about the site, which often has been a place of suffering for former salt workers' families. Only a few people may be interested in recovering this identity, and these are seen as romantics or met with scepticism. Once the process advances, the people and the institutions start seeing the tangible advantages and recover some sense of pride, whether in the work done, on the improved aspect of the area or simply because the site starts *existing* again. In summary, the reasons for this sense of pride may diverge substantially.

As a result, quite often, the official discourse of the authorities differs from that of the managers and, in turn, from that of the local community or the (former) salt workers. Even in consolidated sites, this question is still on top of the table. "What model of salinas do we want? How commercial should the salt be? Can people access the salinas or only the workers? Do we want tourism and what type?" As said, heritage evolves with the needs and the views of people and keeping up to these dynamics is far from easy. A local community-driven process (e.g. Poza de la Sal) seems therefore more sensible and flexible than a top down approach (e.g. Añana). This aspect has crucial relevance, as a lack of identity and sense of belonging can deter a patrimonialization process or even reverse it (e.g. Renard & Thomé 2016).

[170] As an exception, the doctoral dissertation of Margarida Ferreiro offers a management model for the salinas of Aveiro (Ferreiro 2010). Also, one of the (expected) outcomes of the EU Life-funded MC-Salt Project is the "Management Model for Saltworks in Mediterranean and Black Sea in the Natura 2000 Network". This document compares the management plans of different saltworks located in Natura 2000 sites and proposes a common management model. However, the stress of this document is on species and habitat conservation, rather than heritage (unpublished at the time of writing).

Saltscapes as cultural landscapes

Many possible definitions exist of the term "cultural landscape". As has been explained in Chapter 2, it may comprise landscapes with ethnological and vernacular values; places where humans have developed an activity in relative harmony with nature. Under this category, certain landscapes pop easily to mind, depending on the perspective of the reader. Architects will quickly think of gardens and parks, whereas biologists will see natural protected areas with a certain degree of traditional human activity in them. Geographers, on the other hand, will define them as productive, managed landscapes with a certain degree of naturalness. Vague as these may be, all of them will agree on naming landscapes such as vineyards, olive groves, rice paddies, *dehesas*, etc. These examples of cultural landscapes are well-known not only by scholars but also easy to identify by the public. However, few people consider salinas or saltscapes as cultural landscapes. In the case of coastal and estuarine areas, salinas are seen as a part of the broader salt marsh ecosystem, dominated by tidal phenomena. In the case of inland sites, the relatively small size of the salinas do not grant them the category of "landscape", but rather "monument". The wider implications of the presence of salt on the landscape are not readily visible and hence remain unacknowledged. Also, few people suspect the diversity and abundance of saltscapes, even within their own region. These sites used to be off-limits to strangers, when they were in production, and are not always easy to appreciate from a distance. Therefore, there is a general ignorance of the shared values of these sites and a general categorization of saltscapes as cultural landscapes is thus made difficult. The challenge is to include saltscapes as a category of their own in scholarly literature and among institutions and the public.

The legal protection of cultural landscapes is acknowledged both by national and international legislation, as well as planning instruments. However, the implementation of these instruments is far from effective. The construction of a new, industrial salina in Imón, squeezed between a Natura 2000 site and a BIC and clearly affecting the landscape perception of the site, is seen by many with surprise and resignation. Also, the fact that one individual could revoke the declaration of BIC of the salt making area in Gerri de la Sal, on the grounds that it affected her private property, is also seen as a skewed application of the law. A better understanding of the implications of these laws and their spirit, needs to percolate among public administrations and officials.

Salt as a quality food

The debate is still open as to whether salt can be considered a mining or an agricultural product. From a strict point of view, salt is a mineral and not a crop, that can be grown under controlled environmental conditions. However, the management of the water and the brine, the controlled influence of microorganisms and nutrients in the process of salt making, the weather dependence, the *harvesting* techniques and tools and the subtle know-how of the salt makers make solar evaporation salt making an activity more akin to agriculture. Some institutions have already understood this and hand-harvested salt has been declared as an agricultural product in France and Portugal. In other cases, given the uniqueness of the production methods, the artisanal salt has obtained a protection of geographic indication. Many other private seals and certificated have included salt, but a general understanding of hand-harvested salt as a high quality, artisanal, agricultural product is yet to come. One big challenge ahead, for instance, is the acknowledgement of this type of salt by the EU's

organic[171] production certification. As the artisanal salts market has grown more complex, with unclear boundaries of whom is producing what and where, it is hard to distinguish the real "agricultural" salt from the salt produced in sites with "industrial" criteria. Just as it happens with other food products, it should be compulsory to state the location of production and, if possible, the method, too.

In any case, the transformation of a salt making site in a heritage-based business activity becomes a more complex situation that requires a fluid dialogue between the service-oriented management and the productive activity, which have different priorities. Tensions may exist, for instance, between salt makers and visitors; between salt makers and environmentalists or between residents and visitors. Multifunctional landscapes such as these need to deal with the simultaneous uses and functions and be able to show a harmonious, coherent picture to the outside world.

Ethical considerations

As the patrimonialization processes progress, the institution in charge of the management of the site may drift off the course that the initiators had in mind, with the risk of alienation. Or the need to become self-sufficient removes part of the philosophical essence of the project or forces contradictions to arise. Some stakeholders may have ethical issues with this and have expressed them via different media. One example of these is the incongruity of offering a sustainable heritage-based project to the public while selling the hand-harvested salt worldwide. The productive activity itself is carbon neutral, but not the distribution of the product to its final customers, especially those found in other continents. In this line of thought, other stakeholders consider that the communion of the people, the product and the landscape (see also below) can only be enjoyed and understood on site, therefore, the salt should only be obtained at the salinas. If the salt is sold elsewhere, the message of heritage conservation and the provision of a livelihood for the local community does not get across and the product itself becomes banalised. In addition, the frequentation of tourism in salt making areas, especially if these are remote but have a fair number of visitors, risk the gentrification of residential areas. This is a well-known phenomenon in picturesque villages in rural areas all over Europe and it is already happening in some of the study sites. Managers should take care that these phenomena are adequately treated with the different stakeholders involved and try to find solutions that satisfy the needs and feelings of all.

Another ethical consideration is to what extent a productive activity is really sustainable. In order to reach full sustainability, all stakeholders should be on board the project. Often, policy makers make an academic exercise on the sustainability of productive landscapes, while producers focus on profitability; environmentalists try to preserve nature as pristine as possible; residents want to receive many visitors in their shops and restaurants and local administrations aim at halting depopulation[172]. Conflicts of interest are thus common among stakeholders and reaching a balance between them is a complex task. The managers of the site should keep track of the different needs and wishes and provide a fair solution to all.

[171] The term "organic" in English is unfortunate, as it describes the opposite of the chemical nature of common salt, an inorganic compound (sodium chloride). In other languages, the term seems more accurate (*agriculture biologique* in French or *agricultura ecológica*, in Spanish).

[172] These ideas are developed in further detail in Espeix (2008). In the end, it all comes down to matching the discourse with reality, a task that has never been easy.

8.4 The five-step model for integrated salt heritage and saltscape management

One of the main conclusions that can be drawn so far is that there is no standard recipe for sustainable management of saltscapes, no "one-size-fits-all" solution. Cultural landscape scholars have identified the need to combine multifunctionality with profitability and environmentally sound management and demand the support from stakeholders, especially public administrations, and the flexibility of planning and legislation (Vos & Meekes 1999). These aspects have been tackled in different sections of this work and the study of the different patrimonialization processes and management strategies of saltscapes, allow the proposal of a model for its sustainable management[173].

This proposal, entitled as "The five-step model for integrated salt heritage and saltscape management" (Figure 8.5), does not have the intention to become *the* final recipe, but rather a collection of ideas that should be considered when approaching the management of a multifunctional landscape such as saltscapes. It is a complex issue because it must consider several factors that are beyond our control, as the landscape is affected by other regulations, uses and market drivers outside the scope of salt-related functions and values. It is also difficult to generalize, because each site has its own historical background, stakeholder interests, local traditions and habitat structure. Therefore, the model of saltscape management proposed is intended only to serve as a blueprint for more detailed action in each site. The model is based on a sequence of five steps to be taken in chronological order. The steps are meant to be accumulative, that is, rather than being discrete stages of a process, they are a continuous progression towards improvement. Once a step has been taken (acknowledgement, understanding, preservation…) the effort to maintain them alive should continue, regardless of which step we are at.

Figure 8.5: The five-step model of saltscape management (Source: Own elaboration)

[173] The term "sustainability" Is often applied specifically to the environmental aspects of an activity. The only study found on the sustainability of traditional solar salt making, performed in the salt making facilities owned by *Necton S.A.* in Olhão, Portugal, focused on the environmental performance of the site (Marques *et al.* 2009). The production of traditional solar salt and *fleur de sel* was analysed from the point of view of their environmental impact, using well established tools such as Life Cycle Analysis and Ecological Footprint, but neglecting the social aspects of the activity. It concluded that traditional salt making was a "sustainable" activity.

These five steps are:

- To **acknowledge** the existence of the site and its general features.The acknowledgement of the values of the site may start very modestly, usually thanks to the efforts of a few individuals or organizations who attract the attention of a broader audience via dissemination events (presentation, conferences, publications, field trips.…) or activism (demonstrations, reports to authorities, press releases, volunteer action…). At a first stage, the recognition of the values of the site, generally relies on intuition rather than evidence, and knowledge of the heritage values is still patchy. This step coincided with the very early stages of patrimonialization, described above under the section "before patrimonialization". It is a weak stage, requiring an important institutional effort and commitment to pass the threshold to the next.

- To **understand** the natural and cultural values of the site by means of research and inventory. At this stage, a coordinated effort to gain insight on the values of the site is required. It is important to identify the academic organizations, the experts and the institutions who will do the research, based on previous studies they may have done. Most probably, publications on the site's values already exist and some of these experts may have been involved in the previous step. However, a deep understanding of the values of a given site requires a holistic vision of the site, so that the linkages and influences between them are also understood. In saltscapes, where the natural and cultural assets are mutually dependent, this aspect is especially important. To this end, there should be a person or institution coordinating this effort of understanding the site. This step marks the transition between the early stages of patrimonialization and the process in progress.

- To **preserve** the values of the site, by the consolidation, rehabilitation or reconstruction of these values and by the implementation of protection measures. It is the first hands-on stage, in which a real intervention is done on the heritage of the site. This is of course a delicate step, which should be carefully planned and performed by a strong team of professionals, but considering the needs and vernacular knowledge of the local community and, especially, the (former) salt workers. These efforts are complex and a good coordination is essential. This is perhaps the steepest of the steps, because it requires not only a political commitment of the public administrations and other institutions, but also a strong financial investment. At this stage, ideally, an institution should be created *ad hoc* for the management of the site. This is the start of the transition towards a consolidated patrimonialization process.

- To **educate** stakeholders, decision makers, managers and the public in general about the values of the site by means of communication, dissemination and awareness raising actions. The objective of this stage is to offer the results of the previous ones. It can, to a certain extent, occur simultaneously. It is important here to adapt the message to the audience. Policy makers will need to understand the implications of their decisions on the heritage values, whereas managers should be aware of the legal and administrative framework they work in and the public may be interested in the different heritage values and uses, with varying degrees of depth and thematic specialization. Once the patrimonialization process is consolidated, these educational efforts are usually coordinated from the institution in charge of the management of the site. If this is the case, this institution should have a policy of

transparency, public participation and cooperation with other organizations, to strengthen an image of coherence and joint effort among stakeholders.

- To **use** the site with intelligence, by designing sound products and services with sustainability criteria and compatible with each other. The use of heritage should meet conservation goals, as well as obtain a reasonable revenue for the maintenance of the activities involved and achieve self-sufficiency. These uses should be compatible with each other and be tuned in with the needs and wishes of the local community and the managers of the site. A consensus among stakeholders should be reached to strike a balance between the use and exploitation of heritage assets; to define what is reasonable and what is not and to avoid overexploitation, abuse of power or banalization, among other risks. This stage takes place when the patrimonialization process is consolidated and an *ad hoc* institution has the mission to coordinate and manage these efforts. This does not mean the process has come to a halt; this stage is precisely the most dynamic one; where the site's managers fly solo and need to design and provide solutions to the constant challenges that arise.

So far, a linear description of the different, cumulative stages of the management model have been described. But this model needs to rest on solid foundations, which provide a stable, resilient setting and allow continuity despite the changes and challenges that will be faced in the future. Hence, the following aspects will make a relevant contribution to the sustainability of the model. These aspects are:

- **Identity**, as the foundations of any action that will take place at the site. A strong identity, whether already existing or induced by educational actions, will result in a high degree of self-consciousness, a strong sense of belonging and even pride of the local community. The sense of belonging is achieved when the public feels this from within, not necessarily induced by others. The identity delves on an emotional attachment to heritage sites or manifestations, perhaps strengthened by life events associated to them or just because they raise an emotional response. When this sense of pride is present, it will result in a strong motivation from inside out and bottom-up to maintain the sites values and valorize them. Identity is the most important driver for heritage recovery. In the end, it is the glue that makes any given asset (material or intangible, natural and anthropogenic…) become *heritage*. It provides the added value it needs to be acknowledged by a group of people and sparks the desire to protect, disseminate and use it. To make it a part of their livelihood and their community.

- **Participation**, as the tool to ensure motivation by local stakeholders. Some project managers understand participation as a one-sided provision of information (usually from managers to the public) or as a consultation (a non-binding request of opinion). However, full participation should provide power of decision to stakeholders. If true participation in the decision-making processes is achieved, it is easier to reach a consensus on leadership and execution of management measures and the motivation will last longer. A well-developed participation strategy empowers the local community to take decisions concerning their own heritage and their own livelihood associated to it. It is the task of the institutions in charge to ensure a full, balanced participation of stakeholders, in which all voices can be heard and considered.

- **Commitment**, as the guarantee of lasting results. The long-term commitment of managers and stakeholders will contribute to achieve self-sustainability and independence from external support. Those stakeholders with responsibility over the site should commit themselves to seek and provide the necessary human, technical and financial resources to guarantee a sustainable management of the site. In this respect, a public-private partnership has proven to be a healthy combination that fends off the vulnerability of private markets and the volatility of politics. The institutions in charge -preferably representing both the public and the private sectors- should ensure a long-term strategic planning and policy framework that provides stability and coherence to the project. Commitment also motivates participation and gives support to the identity of the place.

These three aspects, as can be seen, are mutually dependent. The sense of identity, mainly of the local community, grows from the seeds of participation. The institutional commitment to the site provides a safety net for this to happen. On the other hand, participation strengthens the feelings of a shared sense of belonging, which may act as a powerful tool to demand the commitment of others. And long-term commitment broadens the scope of identity beyond the local community, towards the public in general. Hence, the three aspects do not simply add up but generate synergies that constitute the solid foundation on which this model is based.

More difficult to add to a conceptual model, but perhaps equally relevant, are certain subjective factors that may make the difference in the outcome of a patrimonialization process and, even, the management of a consolidated site. Buzzwords such as teamwork, a proactive mindset and mutual confidence are key to the success of such a process. In the end, what these words describe is the **attitude** necessary to get -or keep- the process running. Teamwork unites the strengths of a group of stakeholders. A proactive mindset maintains the sprits high, regardless of the natural ups and downs of any process or project. And mutual confidence allows a certain degree of independence in decision making and action, making the process more flexible and agile. To put it simply, these features together constitute the fuel of the process.

Finally, the model should be evaluated periodically to **assess** its achievements and outcomes. An adequate quality control of the planning and management processes will allow a timely adaptation to changes and to modify course when needed. To this end, numerous assessment tools can be used (SWOT analysis, life cycle assessment, project cycle management, logical framework, indicators…). The Deming cycle, often used in quality management in corporate environments, has a simple but effective philosophy: *Plan – do – check* (i.e. assess) *– act*, a thread that can be followed endlessly in a spiral form, in the quest of continuous improvement. The assessment of a process also provides a quality and objectivity check, that goes beyond the personal ideas of managers or the circumstances of each moment in time. It also allows the comparison with others and the evolution of the process, as well as the timely identification of flaws and the needs of resources.

While this model is an abstraction stemming from the analysis of the case studies, the conclusions section provides a list of good practices in the management of saltscapes, that can easily be integrated in this model. More detailed examples of the practices analyzed in this thesis can be found in Chapters 5, 6 and 7.

8.5 Conclusions of the thesis

The conclusions of this work are aligned with the main objectives, that were presented in Chapter 1, namely:

- To analyse the factors that contribute to the sustainable management of salt heritage and saltscapes and how these stimulate local development
- To understand the process of patrimonialization of salt heritage and the drivers that steer it
- To identify the good practices performed in the sound use of salt heritage and saltscapes and their influence in local development
- To describe the challenges and pitfalls in the sustainable management of saltscapes and salt heritage
- To offer a management model that can be applied in other salt-making areas and even in other forms of rural heritage or wetland areas

These general objectives led to the more specific research questions and hypotheses. These were also presented in Chapter 1 and are further explained below each box.

8.5.1 Main research question and hypothesis

Box 8.1: Main research question / hypothesis

Main research question:	How can the management of saltscapes and salt heritage contribute to sustainable local development?
Main hypothesis:	It can be proven that the sustainable management of saltscapes -as a type of cultural landscape that hosts relevant natural and cultural heritage values- actively contributes to local development. However, this can only be achieved with a holistic, innovative, multidisciplinary and participatory approach.

This hypothesis is based on the assumption that saltscapes are considered as complex, multifunctional cultural landscapes in which the production of salt has or has had a central role, with long-term implications in the shaping of the local history, economy, traditions and even habitats. The management of cultural landscapes with criteria of sustainability, that is, considering not only the conservation of their values, but also their responsible use, requires complex measures. In cultural landscapes, a delicate balance exists between the resources naturally present in the area and the use of these resources by humans.

The saltscapes studied here offer a broad spectrum of management strategies. In the first main group considered, saltscapes before patrimonialization, no public management strategy exists. Given the fact that the four sites involved (Espartinas, Arcos de las Salinas, Peralta de la Sal and Salinas de Imón) are in private hands and there is no public involvement in their daily steering, there is a lack of transparency as to the plans for their future. As of today, there seems to be an intention to protect and enhance the values of the first three sites, but no specific actions seem to have been taken. In the case of Imón, a Master Plan has been written in the past, but changes in the ownership have turned it obsolete. This salina is

owned by a more powerful consortium, but there is contrasted evidence of their lack of interest in the heritage values of the site.

Those sites with a patrimonialization process in progress (San Juan, Gerri de la Sal, Rambla Salada and Poza de la Sal) have different management strategies, in some cases backed up by planning documents. However, the managerial structures are still weak and cannot guarantee the accomplishment of their objectives without external support. This is the case in Rambla Salada and Poza de la Sal, where the management of the site is in hands of local associations that strongly rely on volunteer work. In Gerri de la Sal, one single owner is fighting for its heritage and the municipality, small in terms of population, is only capable of offering guided visits to the site. The salinas of San Juan are steered by a trust, but given the composition of the patronage -the municipality, extremely small in terms of population- and some private individuals, has little fundraising capacity.

Those sites with a consolidated patrimonialization process (Læsø, Salinas de Añana, Sečovlje, Guérande) provide the best, albeit diverse, examples of sustainable management. Læsø, being in the hands of a private company, lacks a public business plan. However, the site has been created with the support of the municipality and their managers are actively participating in the tourism and marketing strategy of the island. There are strong links with the local community and synergies have been created with local businesses, especially related to the provision of services for the saltworks and for visitors. There is, therefore, a full integration with local and even regional policies. Hence, the involvement of the local stakeholders is not prevented by the lack of a visible plan. Also, the Natura 2000 management plan is under development and will certainly affect the use of the habitat from which the saltworks obtain the brine.

Salinas de Añana has a broad ranging Master Plan that covers both the cultural and natural aspects of the site. It has evolved from an architectural recovery plan to a fully detailed business plan of the salt making and associated activities, as well as the protection of all its heritage values. Given the multiple protection statuses of the site, both natural and cultural, combining the conservation requirements of all requires a multidisciplinary approach. Given the fact that the Master Plan has been elaborated by the public authorities, the integration of local and regional policies has been ensured. Perhaps the biggest flaw is the top-down approach the management of the site has had, although in later years the community has been more involved in side activities and events.

In Sečovlje, the management is performed by a sister company of a large, public-owned telecommunications consortium. The company is small and can operate with relative independence, but needs to comply with the nature conservation regulations derived from its manifold protection status, also from the cultural point of view. Hence, conservation needs to go hand in hand with the business objectives of salt making and related activities. Participation of the local community is still weak and coordination among stakeholders could improve, but full cooperation is provided with the tourism authorities of the municipality, who in turn need to satisfy the needs of small-scale nature-based initiatives with large tourism corporations which tend to prefer a different type of tourism. In this case, an additional weakness is a certain lack of integration with local policies.

Guérande is the most veteran site with a consolidated patrimonialization process. In this case, the growth of the process can be considered organic, as it stemmed from the very bottom of the local community, the salt makers and the residents. It took years, if not decades, to consolidate, and this has proven crucial to provide the time to draw conclusions from the lessons learnt. The management of the site is steered from the salt makers

themselves, be it in the form of cooperative or individually. The natural protection status obliges them to comply with conservation regulations, which are stated in the Natura 2000 management plan. Although the dialogue between the managers of the site and the tourism and nature conservation authorities is good, their long-term objectives may not coincide and tensions arise occasionally.

As can be seen from the case studies examined, no ideal situation exists. Further down this section, possible explanations to this will be offered. The management of these sites is far from easy and each has found its own way forward, with their own strengths and weaknesses. Whereas the management strategies Læsø and Guérande are strongest on the integration of sectorial policies and the participation of stakeholders, they seem weaker in the provision of a multidisciplinary approach. The opposite can be said about Sečovlje, with a strong multidisciplinary vision, but weaker participation of stakeholders and integration of certain sectorial policies. While in Salinas de Añana both the integration of policies and the multidisciplinarity are ensured and it is the participation of stakeholders that may need improvement. The specific hypotheses will seek to go into further detail of these aspects.

8.5.2 Subquestions and hypotheses (1-4)

Box 8.2: Subquestions 1 / hypothesis 1

Subquestions 1:	How can the protection of saltscapes contribute to the local development and ecotourism of their hinterland? Does the protection of their natural and cultural values enhance their chances of success?
Hypotheses 1:	The legal protection of the natural and cultural values of saltscapes is often a protection on paper. It does not have a relevant role in the initial success of the conservation, dissemination and local development but may support them once initiated by other factors.

The legal protection of multifunctional, cultural landscapes provides a framework of reference, which indicates what can or cannot be done on site in order to best preserve its values. However, the sheer legal protection is only a declaration of intentions that needs to be supported by specific measures, such as a binding management plan or by trickling it down to the municipal ordinances. Legal protection may trigger the attention a specific site may need, without which it may have passed unnoticed, although this holds true only for the public in general and certain public institutions. Individuals or -generally private- institutions sparking a patrimonialization process do not normally respond to already existing formal protection statuses, but rather *induce* them. In most of the study sites involved, the protection status came *after* the sparking of the patrimonialization process, even if this process became stagnated (e.g. Peralta de la Sal, Arcos de las Salinas) or even went backwards at some point (e.g. Imón, Espartinas) (see Figures 5.3 and 8.3). This means that the legal protection of a site is not a *cause*, but a *consequence* of the patrimonialization process. Hence, the role of legal measures is negligible at the first stages of patrimonialization, although it gains importance as the process progresses. Becoming a protected site at the early stages of the process may help to gain the -much needed- attention from public institutions, policy makers, sponsors, opinion leaders, the press, etc. In this case, both processes -protection and patrimonialization- run in parallel and they can take advantage from each other (e.g. by jointly deciding conservation priorities and protection

measures). If the legal protection process takes place well after the patrimonialization has started, it may even interfere with it, as it will create new "rules of the game" that may not have been taken into account at the start of the patrimonialization. Timing, in this respect, is a welcome issue.

It should be noted that some of the sites enjoyed legal protection before patrimonialization starts (e.g. Salinas de Añana was BIC already in 1984), but the bulk of the protection measures cam one the patrimoniaization process had started (also the case in Añana, with its subsequent protection instruments).

Legal protection therefore needs consensus, or at least, acceptance, from all stakeholders involved. Coordination among public authorities, to establish reasonable limits to activities and to avoid overlaps or contradictions in protection measures, is also needed. Planning documents, whether binding or not, should at least have an ethical commitment to the spirit of the law(-s) that protect(-s) the site. This is clearly the case in Salinas de Añana, Guérande or Sečovlje; or even in Poza de la Sal or Rambla Salada[174]. Other sites lack management plans (or, if they exist, they are far too general)[175] that translate the protection laws into concrete measures.

Finally, having a protection status provides the site with an added value only for the sake of it. The higher the norm, the better (international agreements such as Ramsar of World Heritage weight more than national or local instruments). Some members of the public are avid seekers of protected sites and may travel to the region simply for that reason. Logos related to the legal protection instrument constitute a powerful marketing tool for local businesses, which happily advertise the jewels of their region. A case in point here are the Salinas of Imón, historically twinned with the Salinas of La Olmeda. Imón is far better known, not only because its more exposed location, but also because they have been protected as a monument. Añana, on the other hand, clearly felt the blow of their unsuccessful candidacy to UNESCO World Heritage.

Box 8.3: Subquestions 2 / hypothesis 2

Subquestions 2:	How are saltscapes and salt heritage patrimonialized? What are the challenges and pitfalls along the road? Who and what triggers and drives the process?
Hypotheses 2:	There are different patrimonialization processes that may lead to success. Although drivers and challenges may vary considerably, a general pattern of events can be recognised.

As described above, a typical patrimonialization process starts from a situation of decline or abandonment of a site that has a meaning for some individual(-s) or institution(-s). These stakeholders may decide to give public notoriety to the site. Depending on the circumstances, they may choose to become activists or prefer the more political or scientific approach. In the first case, a larger audience will be reached in a shorter span of time, but risks being neglected by the authorities in charge and, of course, will receive the direct

[174] Poza de la Sal and Rambla Salada have good master/management plans; it's the poor financing of measures which makes them inefficient.

[175] Some sites protected under Natura 2000 (e.g. San Juan, Espartinas) have draft management plans, but these hardly pay attention to the (former) salt making activity.

opposition of the entity in charge of the management of the site. The second option provides more rational arguments, but will not reach a large audience, who see this as an academic exercise. On the other hand, policy makers and even managers will be more open for discussion. In any case, most often a combination of both strategies works best, especially if both are coordinated and follow the same goals. This is exactly what happened in Guérande: the public was confronted with demonstrations, even with some degree of violence; whereas the scientific community persuaded policy makers with manifestos, articles, plans and ideas. Pure activism may lead to weak patrimonialization processes, because at some point they will need professional support. In Poza de la Sal, the association in charge of the management of the site has reached a level of workload that can hardly be assumed solely by volunteers. On the other hand, a process driven by the élite, whether intellectual or political, risks not being followed by the public and not being supported by the local community. At some point, this is what happened in Añana.

Despite the efforts of activists or intellectuals, a patrimonialization process can be stagnated for a long time. There seems to be a threshold of tolerance to a certain degree of positive or even negative attention to a site before anything happens. Patrimonialization processes need a spark in order to get from the ground. Be it an event, a celebrity saying the right words, an accident or a serendipitous conjunction of "planets" (ideas, power and money). Without this spark, a stagnated process can generate fatigue, both among activists as among the public, having a pernicious effect on the site that can even go beyond ignorance and indifference. This is the situation, for instance, in Imón. After so many articles -positive and negative- in the press, so many TV reports, so many comments on internet… the site is gliding towards destruction.

Once the spark has triggered a change and stakeholders seem to have aligned in favour of the protection of the site, a general feeling of confidence and hope sets in. All stakeholders are willing to cooperate and agreements are reached easily. At some point, however, the initiators of the process may lose control over it. Most probably the events will not turn in the desired direction and tensions may arise. This has happened virtually in all sites studied, especially in the consolidated ones, where a specific institution is now in charge of the management. A great psychological distance exists then between the initiators of the process and the current managers, some of the latter may be of a younger generation, are hired for their professional skills and do not necessarily feel the same passion or personal commitment to the site. Among the first, the general feeling, in that case, is of a corrupted process, in which the heritage values for which they fought now give way to business making. Such feelings are heard of in Añana or Guérande, for example.

Box 8.4: Subquestions 3 / hypothesis 3

Subquestions 3:	What types of products and services can saltscapes offer? Which of them are compatible with the conservation of their natural and cultural values? Which contribute to the local development of the area?
Hypotheses 3:	Saltscapes can offer a broad range of products and services that are compatible with a sound development and conservation, and compatible among each other.

Saltscapes are cultural landscapes built around a salt making site. Hence, the most obvious product such a landscape can offer, is salt. But salt making sites may provide a whole range of sub-products such as saline muds, mother lay, brine or even halophile species that grow in or around the production site. If these landscapes are considered with a broad vision, many associated heritage values are present: traditional tools and devices, historical buildings, professional know-how, trade roads and paths, defensive structures, saline habitats and associated species, aesthetic values, etc.. Many of these assets can also be recovered and used, being compatible with the salt making activity. In fact, salinas are one of the few preindustrial productive sites that can be recovered for the original purpose they were built for, even using the traditional infrastructures and techniques. By recovering the site for its original purpose, most of its associated natural and cultural heritage values will be preserved more easily, especially those that were needed for the functioning of the site. For example, wooden structures (for basins, channels, pillars…) are better preserved if in contact with brine and obviously, the professional know how will stay alive if the activity is ongoing.

Having said this, it is virtually impossible to maintain a healthy economic activity solely based on salt. Traditional salinas are better off if they combine the production of high quality salt with other products and services they may offer. Besides from the sub-products mentioned above, other products based on them may be offered, with a minimal transformation (cosmetics, wellness products, food items…). Also, tourism and health and wellness services may provide a significant added value to the site and allow economic self-sufficiency. Synergies with other culture- or nature-based products and services in the area may also be an asset. Chapter 7 offers numerous examples of these. In these efforts, it pays off to stay authentic, not only to the site itself but also to its hinterland. Products and services should reflect the identity of the site and avoid being seen as one out of many others, because the public -and of course the customers- will quickly lose interest.

Of course, not all sites are in a state of being capable of producing salt again. The clue is then to find alternative uses and services that may constitute a source of income while maintaining the spirit of the site. In any case, the choice of products and services should be done with enough care to preserve the values that give rise to them. With adequate planning and coordination, many of these are perfectly compatible with conservation, whether self-imposed or established by law. The diversification of products and services on offer in Guérande and Sečovlje are good examples of compatibility between nature conservation and business making. The same can be said about Añana and the preservation of its cultural, architectural values. At a smaller scale, Poza de la Sal, Salinas de San Juan or Rambla Salada are pointing in that direction, too.

Box 8.5: Subquestions 4 / hypothesis 4

Subquestions 4:	What good practices exist in the sound management of saltscapes? How does it contribute to the conservation and dissemination of their values? And to the livelihood of the local community? What factors does the success depend on?
Hypotheses 4:	The successful initiatives in the sound recovery of saltscapes depend on a complex relation between its intrinsic features or the potentially favourable conditions in its hinterland, as well as serendipitous factors beyond the control of managers.

Although each patrimonialization process is unique and is based on the specific features of each site, there are certain good practices that seem to contribute to a successful process, regardless of location. Below the most relevant good practices are offered, which have been observed as most efficient in the study sites. These practices can be understood as steps that need to be taken, preferably in the right order. Together, they will contribute to the conservation and dissemination of the heritage values of the site, as well as provide a livelihood to the local community on the long run.

Before the actual works starts, the stakeholders involved in the process should be adequately identified. Ideally, all stakeholders should feel equally involved, regardless of their power, size of the organization or capacity to work. It is essential to have every stakeholder on board the project from the very start, to avoid tensions in the future.
Especially in small sites, an inadequate identification of actors can result block negotiation with other institutions. On the other hand, small sites have the advantage that stakeholders are very near and known to each other, so that tasks can be distributed with higher flexibility.

Together with the stakeholders, the planning phase can start. It is important to devote enough time for this, so that all possible scenarios are tackled and solutions can be designed. A good plan involves establishing realistic objectives, an adequate time frame to achieve them, and the identification of potential sources of financing and other necessary resources. The master plan of Salinas de Añana is perhaps the most detailed of all the study sites, whereas that of Imón, was more concise and focused only on architectural rehabilitation[176].

In the meantime, stakeholders can provide information about their position about the project, both in terms of availability to take on work as on their opinion of how things should be done. The start of the patrimonialization process is ideal to close agreements between institutions, taking advantage of the initial enthusiasm of all partners involved. For long term agreements, care should be taken in understanding that the situation, both of the stakeholders as of the site, may change over time. In addition, coordination both at horizontal as at sectorial level is important, in order to avoid overlaps, missed opportunities or contradictory goals.

As has been stated throughout this work, the diversification of activities is essential to minimise the risk of failure of salt harvest and increase the incomes to cover costs and have a reasonable margin for profit. Synergies with other stakeholders or even third parties, can multiply the possibilities of products and services that can be offered, spreading and flattening the risks.

However, despite having followed these good practices, there are always certain factors that are beyond the control of the manger. They should remain vigilant, so that these factors affect in the least possible degree the patrimonialization process. Or, to take the best advantage from them, if they affect in a positive sense. Examples of these situations are political willingness, volatile sponsorship, supraterritorial decisions that affect our site, natural catastrophes, etc. The managers should also be flexible enough to adapt new forms of using and disseminating heritage, but at the same time intelligent enough to distinguish

[176] The Natura 2000 plans (e.g. Guérande, Sečovlje) are much less detailed, but they do clearly state the need of a sustainable salt making activity as a means to preserve nature.

acceptable from unacceptable practices. What is acceptable or not may have to be consulted with the stakeholders, too[177].

8.5.3 Concluding remarks

This thesis has looked at the patrimonialization process of the salt heritage and saltscapes and provides ideas for their sustainable management. Three situations have been considered. First, before the patrimonialization process gest from the ground, that is, the very initial stages of the transformation from a salt-making to a heritage-based activity. Second, the process in progress, that is, when patrimonialization has not yet been institutionalised and is driven by civil society in a somewhat disorderly manner. And thirdly, the consolidation of the process by the creation of ad hoc management structures. All these phases have their own challenges, which have also been discussed. After consolidation, new situations arise, and need to be dealt with. Some of them have also been presented.

One of the main questions tackled in this work is the relevance of being protected by a binding instrument. A protection status provides legal support to the conservation goals of a site and can reinforce the feeling of belonging of the local community and identity of the site. But, perhaps the most important conclusion is that the protection of a site is not what initiated the process of patrimonialization, but rather a consequence of it. Therefore, legal protection is not a goal in itself, but an instrument to attain it. This is a very relevant outcome with respect to the management of a heritage site and directly affects management plans and strategies.

The keys to successful patrimonialization, according to the experience of the case studies, can be summed up in the model offered above. It is based on a logical and cumulative sequence of actions of increasing complexity (acknowledgement, understanding, preservation, education, use). The foundations on which the model rests are the combined synergic effect of identity, participation and commitment, as well as the continuous improvement provided by regular assessment. To fuel the process, attitude is key, which can be translated in a teamwork spirit, a proactive mindset and mutual confidence.

If these conclusions should be summarised with one final remark, the phrase that probably nail it, is that the sustainable management of a heritage-based salt making site relies on the communion of three elements: the people, the product and the landscape. Or, in other words, cultural heritage, salt and nature. None of them can achieve the creation of such complex heritage values by itself. This is why salinas are unique landscapes with unique values that badly need attention. The patrimonialization of such sites is far from easy and abandonment or transformation is often preferred. Hopefully this thesis has contributed to shed light on them and offers a hopeful message in the light of (many) of the sites studied.

[177] Do we want marathon races through "our" salinas? Do we want art festivals? Do we want pop concerts? Although most managers will agree to despise the banalization of heritage, the limits are not always clear, and often respond to personal feelings or the urge to obtain the necessary funds rather to than objective criteria…

8.6 Implications for further research

This thesis has provided the conclusions on the study of the patrimonialization process of a limited number of salt making sites in Europe. From them, several new questions arise, that cannot have been tackled here but may be of interest in further research. Although most of these questions refer to saltscapes and salt heritage, but, with minor adaptations, can be applied to other forms of heritage and cultural landscapes. These potential lines of research are presented as follows:

8.6.1 On the methodology

One of the biggest difficulties in the elaboration of this research was the absence of a pan-European inventory of saltscapes and salinas. Partial inventories exist, whether thematic (e.g. protected areas, some of which declare to host these landscapes) or regional (e.g. Spain, Portugal…), but are rather scattered. These inventories are very different in design, presenting the data in diverse formats and degree of detail. Finding reliable information of the sites, their state of conservation and their current state of operation was difficult.

Most of the references regarding artisanal sites stem from the personal information gathered by the author over the years and may therefore include flaws. It was not the objective of this thesis to elaborate such an inventory, but it is certainly a desirable goal, that may prove useful for any further research on the issue.

Al a local scale, other methodological challenges arise. In the study of cultural landscapes, one of the most important challenges is how to measure multifunctionality. The indicator-based tool used in this work can be improved so that it allows the assessment of other forms of cultural landscapes or manifestations of rural culture. While this type of indicator-based tools is commonly used in the evaluation of habitats and ecosystems, they are less well-known in the interface between culture and nature, that is, at landscape level. An adaptation of this tool may prove useful to understand the state and evolution of other forms of dynamic landscapes and heritage. An indicator-based mechanism offers an opportunity to perform comparative analysis within and between sites, at a relatively low cost and the results are easy to communicate to others. This tool can be applied to define the identity of a given landscape and its associated assets; to establish priorities in the recovery and uses of heritage values; to detect the weaknesses and assign the necessary resources to overcome them, or to create synergies on site or between sites.

The combination of a quantitative method -the indicator tool- and a qualitative study -the narratives of the sites- joins the best of two worlds. The objective data obtained by the indicators is complemented by the in depth understanding of the events occurring at the site. This combination can be used for the comparative analysis of other type of cultural landscapes or saltscapes in different cultural contexts (see below).

This study has also stressed the importance on serendipitous factors (willingness to cooperate, opportunities for financing, supra-territorial decisions of relevance to the site…). Given the little control a management body may have on them, these can be one of the most relevant weaknesses of the patrimonialization process. From the methodological point of view, it should be interesting to develop an analytical tool that may help measure the risk of such factors to influence the process, whether from a positive or a negative side. This tool

needs to take into account local and regional circumstances and it may be difficult to objetivize.

8.6.2 On the protection and management of (salt) heritage and landscapes

Another question that arises, of a more conceptual character, is how policies and plans are influenced by the cultural bias of stakeholders. Salt and water have powerful symbolic meanings in all cultures and the protection of saltscapes may be affected by the way different cultures look at them. This is an old claim of southern European countries with respect to EU nature protection policies, strongly biased by the northern perspective, where they have been designed. One could think this north-south (or east-west, if we look beyond Europe) approach can influence the effective protection of these sites, as the priorities and accompanying measures may be defined without a proper knowledge of the local situation. This bias can also be sensitive to time: policies evolve as a response to new threats, challenges or even currents of thought. Hence an aged protection instrument may not adequately respond to present situations. Understanding the cultural and temporal perspective in policy making may contribute to improve the effectiveness of the conservation strategies of the heritage values and the provision of livelihoods for the local community.

Form an applied point of view, one particular instrument that seems to be adequate to these complex heritage and landscapes is the UNESCO's World Heritage. Not surprisingly, the four consolidated sites (Guérande, Sečovlje, Añana and Læsø) have tried or are considering presenting themselves as candidates to obtain protection status. Although they most probably meet the criteria of authenticity and universal, outstanding values, plus other operational criteria required by UNESCO, the fact that they are located in Europe may be a handicap. On the other hand, no artisanal solar evaporation salt making site has ever been declared as World Heritage as of yet and this may be an opportunity to present a combined serial candidateship.

From a more practical point of view, it should also be interesting to compare management plans of different saltscapes -or other cultural landscapes-, to understand the priorities of their managers. Most salt making sites are steered by planning documents specifically required by their protection status (i.e. Natura 2000 management plans), but these put the emphasis on the protection priorities of the instrument in question (in this case, habitats and species) and not on the site as a whole. Business plans, an altogether different type of management document, mainly of internal use, focus on the commercial goals of the salinas Yet others describe the details of the rehabilitation of its infrastructures, etc. Few plans have a holistic, integrated vision of the site, including the role of the local community. The study in depth of different types of management instruments may contribute to propose a more detailed management model, developing further in depth the one presented here.

One specific aspect of management, the dissemination of the heritage values of a salt making site to the public via museums, visitor centres, etc., can also be studied more in depth. There seems to be two main types: classical museum-like facilities, often associated to inland sites, and especially to salt mines, and interpretation centres; and interpretation centres, usually found in natural protected areas. The first are based on the passive exhibit of collections of items, whereas the second are focused on "translating" heritage to the public, with a scant collection. The question here is which of the two approaches works best in providing a lasting understanding of salt-related heritage. Furthermore, can a model of postmodern museum,

which combines both quality collections and interpretation, as well as the other functions of a proper museum (e.g. research) be found for sites with a limited budget? A comparison with other museums located in similar forms of heritage sites (former productive places, sites of ethnographical interest) and background (rural areas, wetlands) can be helpful, too.

More specific, but also of interest, is the study of patrimonialization processes and management of heritage values in industrial salt making sites. Given their size, many of them are protected for their natural values and are obliged to comply with conservation measures and provide a management plan, and even have visitor centres (Torrevieja, Cabo de Gata, San Pedro del Pinatar… in Spain). Others are suffering from the concurrence from even larger industrial sits overseas and are looking at the experience of artisanal salt making sites to apply some of the ideas implemented by them. In certain sites, efforts have been made to collaborate with stakeholders and join efforts to protect nature while offering industrial products and provide leisure services. The best-known examples are the Salinas of the Camargue region in France, Torrevieja in Spain or Castro Marim in Portugal[178]. The use of heritage in these sites responds to a very different motivation and the process differs from what has been found in this work, but can also be worth looking at. If heritage is preserved, in its broadest sense, looking at how these sites do it may provide new, useful ideas and strategies.

8.6.3 On other patrimonialization processes

This thesis has provided a European perspective on the patrimonialization process of a very specific type of cultural landscape, saltscapes and even yet, it has not been able to cover all the potentially interesting examples in the field and perhaps a look into complex territories in which salt is protagonist, may be of interest too (the region of Aveiro in Portugal, an estuary dotted with small individual salinas, or the Delta del Po natural park in Italy, a vast territory with salinas in different stages of operation). Other types of saltscapes not studied here face different challenges with respect to sustainability and the provision of a livelihood for local communities. Examples of these saltscapes are natural saline lakes and rivers (present in Spain and Turkey, mainly); industrial saltworks (e.g. in the western Mediterranean); brine wells with nearby seething facilities (most of them in central Germany); emerging artisanal scale saltworks (in the UK and Scandinavia). A comparative study with solar evaporation facilities can shed light on the patrimonialization processes these sites may have undergone and how these can be useful for others in previous stages of the process.

It should be interesting to gain understanding on similar processes elsewhere in the world, which most probably face similar challenges, but surely have found different solutions to overcome them. Saltscapes and salinas are found around the globe, but their environmental, social, political and economic conditions are certainly very diverse. Especially interesting are the landscapes of Maras in Peru or the numerous and very salinas of Mexico. Hence the strategies and the resources available to tackle sustainability issues may be very different. In times of crisis, looking at fresh ideas from elsewhere may provide unexpected opportunities for the recovery and responsible use of heritage.

[178] Such efforts have also been done in large saltfields overseas. Examples are the Salinas of the San Francisco Bay in the USA (Williams 2001) or the Yannarie saltfields in Australia (Mottershead & Davidson 2009)

One particular situation with respect to patrimonialization is the case of large salt lakes in retreat. Several well-known salt lakes and other saline bodies of water in the world are shrinking to dangerous levels, threatening to disappear. This is happening in the Aral Sea (Kazakhstan), Urmia Lake (Iran) or the Dead Sea (Israel/Jordan). Other environmental threats exist to many other saline lakes worldwide (eutrophication, dust deposition, fluctuating water levels). Most of them have been well-studied from the point of view of limnology and ecology, but little is known about the communities that depend on the resources these lakes provide. What are these communities doing now? Have they simply moved elsewhere? Have they found an alternative livelihood on site? The question here is if these lakes are or should be patrimonialized and how would that contribute to the livelihoods of the local communities depending on them. The identification of (partial) success stories, as has been proposed in this thesis, can be helpful, too.

Also, managers of other cultural landscapes may have found different ways to achieve a reasonable degree of conservation and sustainable management. One can think of researching foodscapes such as vineyards, olive groves, *dehesas*, etc[179]. Or other productive sites such as open cast mining or mountain pastures. Maybe also other types of wetlands, such as natural salt marshes, saline lakes, rice paddies, estuaries… These landscapes share a common feature: the human presence and their dependence on the natural resources they host. Some of these types of landscapes have been patrimonialized a long time ago and are now successful examples of sustainable management. Comparing saltscapes with them may also provide insight in good practices.

8.6.4 On the uses of (salt) heritage

The uses of heritage may cause controversy among stakeholders. Some have a traditionalist view (heritage can only be used for its original purpose or else for contemplation) and others have a more daring vision, allowing new uses as long as its essence is not altered. While this can become an endless and visceral discussion, it may be useful to catalogue the different uses heritage and cultural landscapes have, as well as how they have originated and what degree of acceptance they have at local level. The goal is to understand which of these uses are more stable in time, and which are more sensitive to fashion. Distinguishing among these may make the difference between a truly sustainable management of a given site… or not.

Within this train of thought, a socioeconomic study of the market of traditional salt and salt-related products and services may provide insight in the relative importance of each segment (salt itself, tourism, health and wellness…). If possible, a longitudinal study of these products can be made, trying to understand the evolution of artisanal salts, the names they have been given, the types that exist, how are they advertised, etc. This may provide an indication of the strength of these salts in the market or how big the risk is of a "salt bubble".

A comparative study with the evolution of consolidated high end culinary products such as olive oil, wine or cheese may provide insight into the trends these food items follow and what may seem a future scenario for salt, too. To this end, the comparison with other emerging quality foodstuffs such as mineral water, artisanal bread or beer, may be helpful, too.

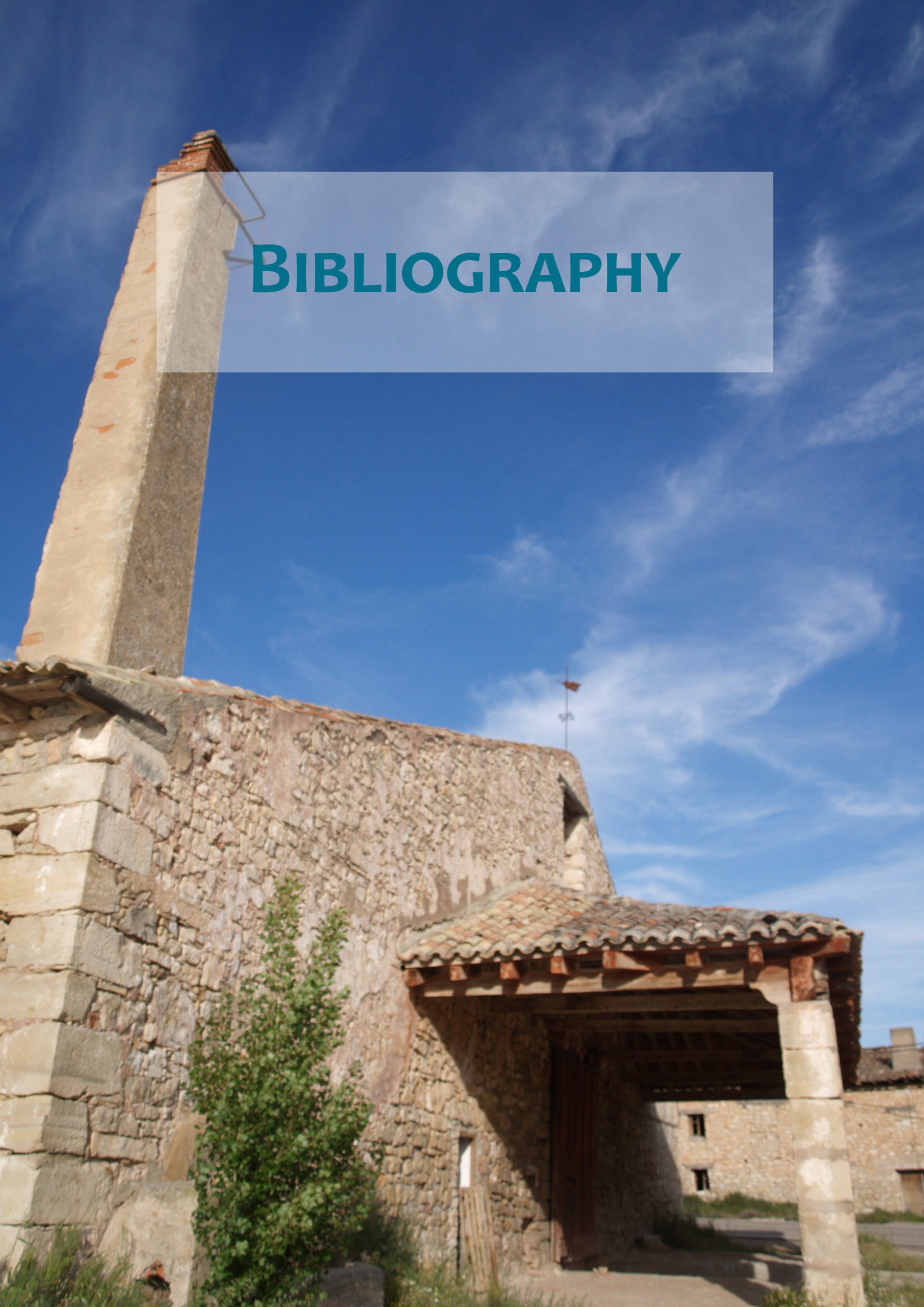
[179] Abundant scholarly interest already exists on the patrimonialization of the landscapes and heritage of foodstuffs such as coffee, sugar or chocolate (Joliffe 2012, Kleidas & Joliffe 2010, Urquijo & Bullen 2009).

The provision of additional services such as tourism, health and wellness is a growing business. How these services also contribute to the sustainability of the site in terms of employment, revenues and conservation can also be studied further in depth. A comparison with similar services in cultural landscapes may provide understanding on how they contribute to the sustainability of the site.

Finally, the compatibility and potential synergies between artisanal salt production, the provision of ordinary services (tourism, health) and the use of a salina for scientific research and technological development (based on microorganisms and chemical compounds it hosts) needs to be studied further in depth. The latter may provide a good source of income and add to the perceived heritage value of the site. The question then is whether these "salinas 2.0" can be considered heritage, too.

8.7 In summary

The identification of the challenges salt making sites face allows to understand the constraints to patrimonialization processes and to put each site into its geographical and sociocultural context. The SWOT analysis provided here summarises these difficulties. But, perhaps, the most important challenge is a combination of (administrative) indifference and ignorance (of policy makers and the public). The patrimonialization processes of the sites, analysed here, shows that these are far from linear and often depend on factors beyond the control of managers. The relevant role of the local community in the success of the processes is highlighted. The dynamic nature of patrimonialization processes also indicates that there are always challenges ahead, no matter how consolidated the situation may seem. Flexibility, resilience, cooperation and participation are key assets in maintaining the success, features that are also included in the "five-step management model" proposed above. In the conclusions of the different research questions and hypotheses these questions are responded to. The main conclusion is that there is not one single model of success, but that it rather depends on the unique combination of environmental and social features of the site, which in turn steer the opportunities of financing. However, serendipity plays a role in the success of the sites, too. Another important issue is the role of protection instruments in the process of patrimonialization. These seem to be relevant once the process has started, but do not have enough strength to start them by themselves. The most important trigger of these processes is the willingness of some members of the local community -whether individuals or groups- to defend their heritage and their capacity to mobilise human, political and financial resources. Once this process is progressing and growing, a specific managerial structure is needed to take over the control of the site with professional criteria. Running a heritage-based project needs a multifunctional use of the landscape, with the provision of combined services and products (quality food, wellness, eco-cultural tourism) that should be compatible with each other and with the conservation of the site's heritage values. At this stage, the process can be considered consolidated and faces new challenges, derived from this radical shift from abandonment, to volunteerism and to professionalization. In summary, the shift from a productive activity in decline to a heritage-based business, with all the environmental and sociocultural implication it bears. Similar patrimonialization processes can take place in other salt-related sites (saline lakes, salt mines, industrial saltworks) and other cultural landscapes, and elsewhere in the world. The implications for heritage conservation and the livelihoods of local communities can be studied in these locations, too. The methodology used in this work and the results obtained, hope to serve as tools for future research in these fields.



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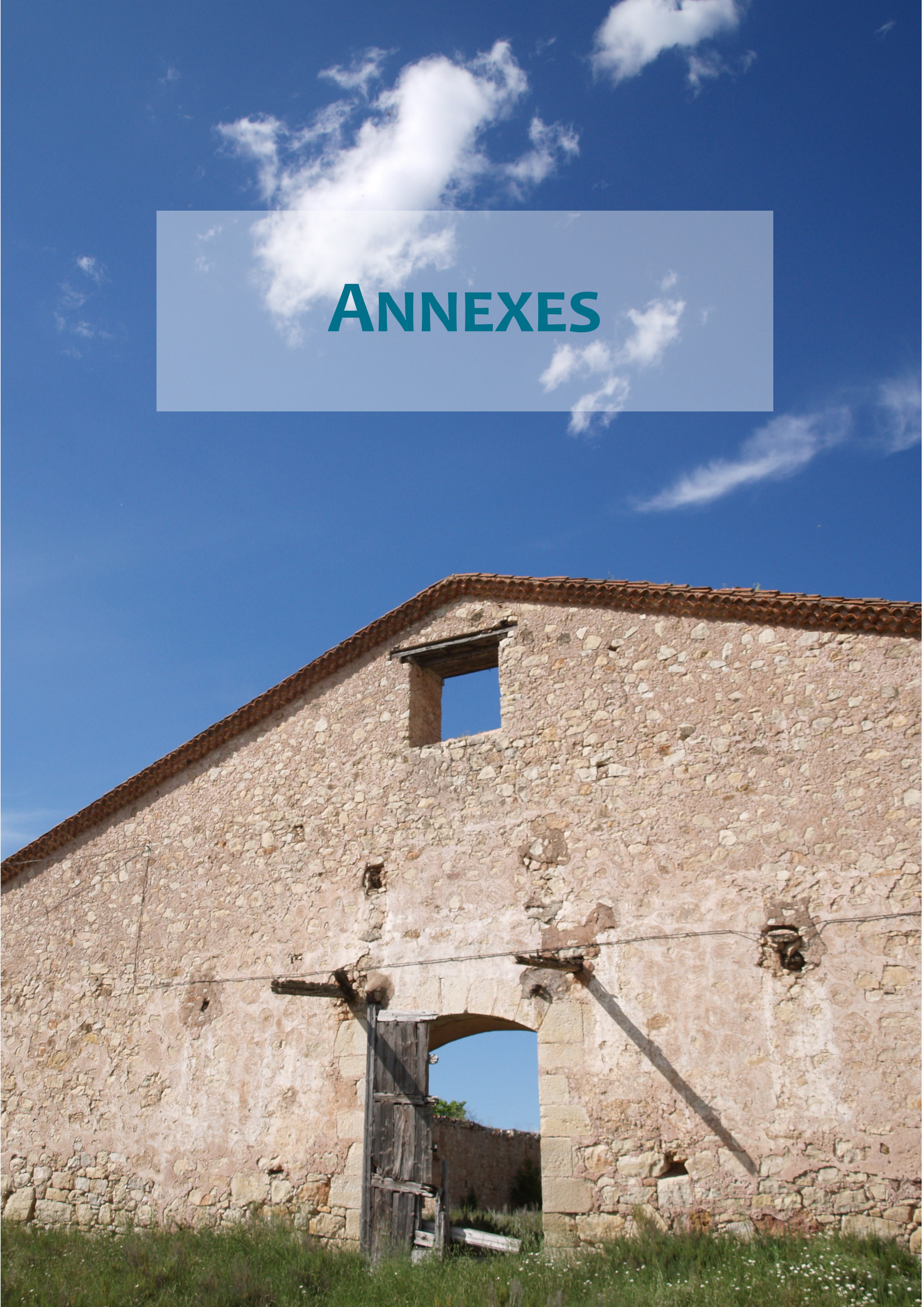
Annexes



Annex 1: Indicator worksheets of local development and tourism in salinas

Table A1.1: Overview of the indicators used

Intrinsic	Extrinsic
General	
IG1 Historical relevance	N/A
IG2 Protection status of the site	
IG3 State of natural conservation	
IG4 State of cultural conservation	
IG5 State of conserv. intangible heritage	
Development	
ID1 Site in operation	ED1 Stakeholder diversity
ID2 Development plans	ED2 Companies using salt
ID03 Organisation of salt makers	ED3 Visibility of the salt business
ID4 Participation in projects or networks	ED4 Direct employment
Tourism	
IT1 Tourism plans	ET1 Climate/Seasonality of visitors
IT2 Visitor infrastructures on site	ET2 Tourist attractions nearby
IT3 Motivation of visitors	ET3 Time of travel from main tourist markets
IT4Yearly nr of visitors	ET4 Eating facilities close to the site
IT5 Accessibility of the site	ET5 Site included in package tourism
IT6 Visibility of the site	ET6 Aesthetic aspects

INDICATOR WORKING SHEET

Site: Country:
Name of researcher/institution:
Date:

Nr and name of the indicator	IG1 Historical relevance
Category	Intrinsic / General
Type	Qualitative
Detailed description	Site is common, relevant or unique at local, regional or national level due to historical, architectural, ecological or technical reasons
Data needed to obtain	Knowledge of the historical, technical, architectural or natural relevance of the site with its geographical context
Source of data	Interviews with experts Review of relevant (preferably scientific) literature Cite experts and references in the observations section
Frequency of calculation	Once (revise literature periodically)
Obtained result*	
Result according to tables*	
Value according to tables*	
Expected trends*	
Observations*	

*Site-specific information

INDICATOR WORKING SHEET

Site: Country:
Name of researcher/institution:
Date:

Nr and name of the indicator	IG2Protection status of the site
Category	Intrinsic / General
Type	Qualitative
Detailed description	Legal protection measures of the cultural natural values of the site and its level (international, national, regional or local)
Data needed to obtain	Legal protection status(es)
Source of data	Interviews with local and regional authorities on cultural and environmental affairs Databases of regional and national competent authorities
Frequency of calculation	Once
Obtained result*	
Result according to tables*	
Value according to tables*	
Expected trends*	
Observations*	

*Site-specific information

INDICATOR WORKING SHEET

Site: Country:
Name of researcher/institution:
Date:

Nr and name of the indicator	IG3 Natural conservation status
Category	Intrinsic / General
Type	Quantitative
Detailed description	Presence of flora and fauna species listed in the Habitats and Birds Directives, whether the site is included or not in the Natura 2000 network
Data needed to obtain	List of fauna species present in the area Comparison with the Habitats and Birds Directives
Source of data	Interviews with experts Review of scientific literature Natura 2000 database (if site is within the network)
Frequency of calculation	Yearly
Obtained result*	
Result according to tables*	
Value according to tables*	
Expected trends*	
Observations*	

*Site-specific information

INDICATOR WORKING SHEET

Site: Country:
Name of researcher/institution:
Date:

Nr and name of the indicator	IG4 State of cultural conservation
Category	Intrinsic / General
Type	Qualitative
Detailed description	Type of buildings, infrastructures, tools and devices; do they need reconstruction, restoration or replacement
Data needed to obtain	Total surface of standing structures Surface of standing structures visible and in function Surface of standing structures in need of minor restoration Surface of standing structures in need of major restoration
Source of data	Visit to the site
Frequency of calculation	Yearly
Obtained result*	
Result according to tables*	
Value according to tables*	
Expected trends*	
Observations*	

*Site-specific information

INDICATOR WORKING SHEET

Site: Country:
Name of researcher/institution:
Date:

Nr and name of the indicator	IG5 State of conservation of intangible heritage
Category	Intrinsic / General
Type	Qualitative
Detailed description	Presence of (former) salt makers in the area that are willing and able to explain how salt is/was being produced in the area; other traditions and festivities
Data needed to obtain	Contact with (former) salt makers Explore their willingness and ability to speak in public
Source of data	Interviews with (former) salt makers
Frequency of calculation	Yearly
Obtained result*	
Result according to tables*	
Value according to tables*	
Expected trends*	
Observations*	

***Site-specific information

INDICATOR WORKING SHEET

Site: Country:
Name of researcher/institution:
Date:

Nr and name of the indicator	ID1 Site in operation
Category	Intrinsic / Development
Type	Quantitative
Detailed description	Is the site producing salt or brine for commercial or demonstration purposes, for what uses (industrial, gourmet) and by which method (industrial, semi-industrial, artisanal)
Data needed to obtain	Products offered by the site Distribution of products Method of production
Source of data	Owner of the site
Frequency of calculation	Yearly
Obtained result*	
Result according to tables*	
Value according to tables*	
Expected trends*	
Observations*	

*Site-specific information

INDICATOR WORKING SHEET

Site: Country:
Name of researcher/institution:
Date:

Nr and name of the indicator	ID2 Development plans
Category	Intrinsic / Development
Type	Qualitative
Detailed description	Existence of management or development plans for the site
Data needed to obtain	Plans, proposals
Source of data	Interviews with local and regional authorities Owners
Frequency of calculation	Once
Obtained result*	
Result according to tables*	
Value according to tables*	
Expected trends*	
Observations*	

*Site-specific information

INDICATOR WORKING SHEET

Site: Country:
Name of researcher/institution:
Date:

Nr and name of the indicator	ID3 Organisation of salt makers
Category	Intrinsic / Development
Type	Qualitative
Detailed description	How are the salt makers organised among themselves, does their salt have some external quality seal
Data needed to obtain	Type of organisation Quality seals of the salt
Source of data	Interviews with salt makers and owners
Frequency of calculation	Once
Obtained result*	
Result according to tables*	
Value according to tables*	
Expected trends*	
Observations*	

*Site-specific information

INDICATOR WORKING SHEET

Site: Country:
Name of researcher/institution:
Date:

Nr and name of the indicator	ID4 Participation on projects or networks
Category	Intrinsic / Development
Type	Qualitative
Detailed description	Past or present participation in projects and networks, and whether interregional and/or cross-sectorial
Data needed to obtain	Plans, proposals
Source of data	Interviews with local and regional authorities Owners
Frequency of calculation	Once
Obtained result*	
Result according to tables*	
Value according to tables*	
Expected trends*	
Observations*	

*Site-specific information

INDICATOR WORKING SHEET

Site: Country:
Name of researcher/institution:
Date:

Nr and name of the indicator	IT1 Tourism plans
Category	Intrinsic / Tourism
Type	Qualitative
Detailed description	Existence of public use or tourism plans for the site
Data needed to obtain	Plans, proposals
Source of data	Interviews with local and regional authorities Owners
Frequency of calculation	Once
Obtained result*	
Result according to tables*	
Value according to tables*	
Expected trends*	
Observations*	

*Site-specific information

INDICATOR WORKING SHEET

Site: Country:
Name of researcher/institution:
Date:

Nr and name of the indicator	IT2 Visitor infrastructures on site
Category	Intrinsic / Tourism
Type	Qualitative
Detailed description	Presence of infrastructures to facilitate the visit to the site (signs, panels, information centres, interpretation centres, museums…) and their opening times
Data needed to obtain	Characterisation of visitor infrastructures
Source of data	Visit to the site
Frequency of calculation	Yearly
Obtained result*	
Result according to tables*	
Value according to tables*	
Expected trends*	
Observations*	

*Site-specific information

INDICATOR WORKING SHEET

Site: Country:
Name of researcher/institution:
Date:

Nr and name of the indicator	IT3 Motivation of visitors
Category	Intrinsic / Tourism
Type	Qualitative
Detailed description	Predominant type of visitors arriving at the site, distinguishing between school visits, generalist tourists (excursions, serendipitous visits, not previously informed), eco/cultural tourists (choose site actively, are previously informed, may have a specialised or specific interest). The latter do not need to be predominant, but their regular presence is enough to choose this category.
Data needed to obtain	Type of visitors
Source of data	Interview with tourist authorities Personal observations at the site Related tourism research results, if any
Frequency of calculation	Yearly
Obtained result*	
Result according to tables*	
Value according to tables*	
Expected trends*	
Observations*	

*Site-specific information

INDICATOR WORKING SHEET

Site: Country:
Name of researcher/institution:
Date:

Nr and name of the indicator	IT4 Yearly nr of visitors to the site
Category	Intrinsic / Tourism
Type	Qualitative
Detailed description	Number of visitors arriving per year at the site
Data needed to obtain	Visitors per year
Source of data	Local tourist office/authority Owners
Frequency of calculation	Yearly
Obtained result*	
Result according to tables*	
Value according to tables*	
Expected trends*	
Observations*	

*Site-specific information

INDICATOR WORKING SHEET

Site: Country:
Name of researcher/institution:
Date:

Nr and name of the indicator	IT5 Accessibility of the site
Category	Intrinsic / Tourism
Type	Qualitative
Detailed description	Is the site accessible for people with motor, cognitive or sensorial disabilities, and if so, what parts of the site
Data needed to obtain	Parts of the site that are possible to visit on wheelchair or for people with hearing or visual deficiency
Source of data	Visit to the site
Frequency of calculation	Yearly
Obtained result*	
Result according to tables*	
Value according to tables*	
Expected trends*	
Observations*	

*Site-specific information

INDICATOR WORKING SHEET

Site: Country:
Name of researcher/institution:
Date:

Nr and name of the indicator	IT6 Visibility of the site
Category	Intrinsic / Tourism
Type	Qualitative
Detailed description	How is the site publicised in different media (internet, press, publications, leaflets, posters…) and how these publications are distributed
Data needed to obtain	Texts published and their format and distribution
Source of data	Visit to the site Visit to the nearest villages/towns Internet search
Frequency of calculation	Yearly
Obtained result*	
Result according to tables*	
Value according to tables*	
Expected trends*	
Observations*	

*Site-specific information

INDICATOR WORKING SHEET

Site: Country:
Name of researcher/institution:
Date:

Nr and name of the indicator	ED1 Stakeholder diversity
Category	Extrinsic / Development
Type	Qualitative
Detailed description	How many organisations / institutions are involved in the management of the site
Data needed to obtain	Type and relevance of organisations
Source of data	Interviews with salt makers and owners Interviews with authorities
Frequency of calculation	Once
Obtained result*	
Result according to tables*	
Value according to tables*	
Expected trends*	
Observations*	

*Site-specific information

INDICATOR WORKING SHEET

Site: Country:
Name of researcher/institution:
Date:

Nr and name of the indicator	ED2 Companies using salt
Category	Extrinsic / Development
Type	Qualitative
Detailed description	How many and what kind of businesses exist in the area that use salt and salt-related resources, are these companies local or not
Data needed to obtain	Type and relevance of companies; products and services they offer
Source of data	Interviews with salt makers and owners Interviews with authorities and local development office
Frequency of calculation	Yearly
Obtained result*	
Result according to tables*	
Value according to tables*	
Expected trends*	
Observations*	

*Site-specific information

INDICATOR WORKING SHEET

Site: Country:
Name of researcher/institution:
Date:

Nr and name of the indicator	ED3 Visibility salt business
Category	Extrinsic / Development
Type	Qualitative
Detailed description	How is the site publicised in different media (internet, press, publications, leaflets, posters…) and how these publications are distributed
Data needed to obtain	Texts published and their format and distribution
Source of data	Visit to the site Visit to the nearest villages/towns Internet search
Frequency of calculation	Yearly
Obtained result*	
Result according to tables*	
Value according to tables*	
Expected trends*	
Observations*	

*Site-specific information

INDICATOR WORKING SHEET

Site: Country:
Name of researcher/institution:
Date:

Nr and name of the indicator	ED4 Direct employment
Category	Extrinsic / Development
Type	Qualitative
Detailed description	What type of employment is there related to the salt businesses? Full time or seasonal? What sectors?
Data needed to obtain	Number and quality of jobs directly related to salt and its by-products and services
Source of data	Interview with owners Interview with local authorities Interview with other salt related businesses
Frequency of calculation	Yearly
Obtained result*	
Result according to tables*	
Value according to tables*	
Expected trends*	
Observations*	

*Site-specific information

INDICATOR WORKING SHEET

Site: Country:
Name of researcher/institution:
Date:

Nr and name of the indicator	ET1 Climate/ Seasonality of visitors
Category	Extrinsic / Tourism
Type	Qualitative
Detailed description	Presence of seasonal peaks in visitor arrivals (school year, weekends, summer…) or not (regular flow of visitors year round) at the site
Data needed to obtain	Visitor numbers per day of the week or month Opening times
Source of data	Local tourism office / authority / owners Tourism research results Personal observations Climogram of the area
Frequency of calculation	Yearly
Obtained result*	
Result according to tables*	
Value according to tables*	
Expected trends*	
Observations*	

*Site-specific information

INDICATOR WORKING SHEET

Site: Country:
Name of researcher/institution:
Date:

Nr and name of the indicator	ET2 Presence of tourist attractions nearby
Category	Extrinsic / Tourism
Type	Qualitative
Detailed description	Presence of historical towns, buildings, monuments, natural protected areas, beaches, etc. and their degree of concentration, if any, in the surroundings of the site (<15 km or 15 min by car).
Data needed to obtain	List of (protected) monuments in the area List of natural protected areas List of beaches in the area Degree of concentration Presence of services (accommodation, food, fuel..)
Source of data	Local tourist office Local authorities
Frequency of calculation	Once
Obtained result*	
Result according to tables*	
Value according to tables*	
Expected trends*	
Observations*	

*Site-specific information

INDICATOR WORKING SHEET

Site: Country:
Name of researcher/institution:
Date:

Nr and name of the indicator	ET3 Time of travel from main tourist markets
Category	Extrinsic / Tourism
Type	Qualitative
Detailed description	Time needed to get to the site from the nearest most important town (usually the capital of the region) or nearest important attraction. If another is chosen, please explain why in the observations.
Data needed to obtain	Distance in real driving time (please take into account road types and usual traffic conditions in the area)
Source of data	Personal observation
Frequency of calculation	Once (repeat if road / traffic conditions change)
Obtained result*	
Result according to tables*	
Value according to tables*	
Expected trends*	
Observations*	

*Site-specific information

INDICATOR WORKING SHEET

Site: Country:
Name of researcher/institution:
Date:

Nr and name of the indicator	ET4 Eating facilities close to the site
Category	Extrinsic / Tourism
Type	Qualitative
Detailed description	Distance to the nearest restaurant or public facility serving warm meals
Data needed to obtain	Restaurants in the area of the site
Source of data	Local tourism office /authority
Frequency of calculation	Yearly
Obtained result*	
Result according to tables*	
Value according to tables*	
Expected trends*	
Observations*	

*Site-specific information

INDICATOR WORKING SHEET

Site: Country:
Name of researcher/institution:
Date:

Nr and name of the indicator	ET5 Site included in package tourism
Category	Extrinsic
Type	Qualitative
Detailed description	Site included in packages such as bus tours, day cards or similar; or in combination with local businesses such as restaurants, museums, spas, etc. Please observe the scope (local, national, international) and type of public (local/captive/upmarket) at which the packages are aimed
Data needed to obtain	Packages offering a visit the site
Source of data	Local tourism office Internet
Frequency of calculation	Yearly
Obtained result*	
Result according to tables*	
Value according to tables*	
Expected trends*	
Observations*	

*Site-specific information

INDICATOR WORKING SHEET

Site: Country:
Name of researcher/institution:
Date:

Nr and name of the indicator	ET6 Aesthetic aspects
Category	Extrinsic / Tourism
Type	Qualitative
Detailed description	Presence or not of pollution at the site or its surroundings (waste dumps, foul smell, noise) or elements disturbing the landscape (large buildings, roads, industrial infrastructures…)
Data needed to obtain	View of the site
Source of data	Visit to the site
Frequency of calculation	Yearly
Obtained result*	
Result according to tables*	
Value according to tables*	
Expected trends*	
Observations*	

*Site-specific information

Annex 2: List of informants

The following tables list the informants that have been consulted during the fieldwork of these thesis. The interviews have been very different in nature, from semi-structured, to focus groups and informal conversations. The settings have been very diverse, too. Interviews have been done in the field, in offices, in public spaces or over the telephone. Again, my gratitude to them for their time, effort and passion.

Table A2.1: List of informants in the study sites in Spain

Name	Institution
Salinas de Añana	
Valentín Angulo	Gatzagak S.L.
Kristina Arregui	Fundación Valle Salado
Mikel Landa	Estudio Landa Ochandiano
Juan Ignacio Lasagabaster	Diputación Foral de Álava
Roberto López de Eguílaz	Fundación Valle Salado
Edorta Loma Vadillo	Saltmaster
Clemente Pérez de Nanclares	Saltmaster
Juan Carlos Medina	Mayor Salinas de Añana
Javier Muguruza	Diputación Foral de Álava
Macarena Ruiz	Diputación Foral de Álava
José María Villanueva	Diputación Foral de Álava
Arcos de las Salinas	
Cristina Albir Herrero	Scholar
Jose Luis Alvir Mnez	Mayor Arcos de las Salinas
Silvia Collado	Owner
Francisco Cubel	Association La Sabina
Emilio Iranzo	Universidad de Valencia
Salinas Espartinas	
Mariano Ayarzagüenza	SEHA
Daniel Carvajal	SEHA
María Elena García	Mayor of Ciempozuelos
Jesús-Fernando López Cidad	SEHA
Luis Felipe Mazadiego	SEHA
Marcos Sánchez Quesada	Municipality of Ciempozuelos
Santiago Valiente	SEHA
Gerri de la Sal	
Eloi Calvo	Deputy mayor Baix Pallars
Xavier Farré	Saltmaster
Dolors Morgó	Saltmaster / tourist guide
Aroa Yagüe	Consorci Gerri de la Sal
Imón	
Primitivo Alguacil	Municipality of Sigüenza
Julio Álvarez	Universidad de Alcalá
Sonsoles Arcones	Municipality of Sigüenza
Amparo Donderis	Archive of Sigüenza
Eduardo	Saltmaster
Javier Fúnez	Manager
Gloria de las Heras	Fundación Ciudad de Sigüenza
José Juste	Architect
Raúl López	Saltmaster
José Manuel Latre	Mayor of Sigüenza
Mariano Martínez	Saltmaster
Avelina Melús	Tourism office of Sigüenza
Diego Moreno	Junta de Castilla – La Mancha

Table A2.1: List of informants in the study sites in Spain (Cont.)

Name	Institution
Peralta de la Sal	
Paco Aznar	Journal "Somos Llitera"
Luis Pedro Boteller	Association Castell de la Mora
Lluis Fuster	Association Castell de la Mora
Patricia Fuster	Association Castell de la Mora
Pilar Meler Sanvicente	Mayor Peralta de la Sal
Lluis Porté	Owner
José Salas "Pepito"	Saltmaster
Javier Sánchez Mez de Barrios	Casa Santuario San José de Calasanz
Gonzalo Tomás	Association Castell de la Mora
Pepa Tomás	Association Castell de la Mora
Sebastián Vidal	Tourism authority Comarca La Llitera
Poza de la Sal	
Benito del Castillo	Community of Heirs / Scholar
Félix Fernández	Association "Amigos de las Salinas de Poza"
Policarpo de la Fuente	Association "Amigos de las Salinas de Poza"
Esther García	Tourism office
Manu Gil	Theatralized visits
Itziar González de Arana	Visitor Centre Las Salinas
Narciso Padrones	Association "Amigos de las Salinas de Poza"
Jesús Peña	Former Visitor centre
Pablo Puente	Association "Amigos de las Salinas de Poza"
Eugenia Ruiz	Saltmaster
Eduardo Sáiz	Scholar
José Tomás	Mayor Poza de la Sal
Rambla Salada	
Miguel Chamón Fdez	Directos Natural Park
Miguel Ángel Núñez	Association "La Carraca"
Gregorio Romero	Regional Government Murcia
Alejandra Sánchez Sánchez	Arquitect
Miguel San Nicolás del Toro	Regional Government Murcia
Caridad de Santiago Restrepo	Regional Government Murcia
San Juan	
Santos Cirujano	Royal Botanical Garden
Javier Cortés	Regional Government Castilla – La Mancha
José Luis Huarte	FUNADER /Municipality of Saelices de la Sal
José Luis Sotillo	Mayor Saelices de la Sal
José Manuel Monasterio	GeoPark Alto Tajo
Susana Molinero	Former Ministry of the Environment
Rafael Ruiz	Former Director Natural Park

Table A2.2: List of informants in the study sites in Europe

Name	Institution
Marais salants de Guérande	
Emmanuel Blanc	Terre de Sel
Gildas Buron	Musée des Marais Salants
Gabriel Courousse	AFPS
Michel Evain	Maison des Paludiers
Delphine Maçonnerie	Cap Atlantique
Frédéric Miché	Trainer
Christophe Nicol	APROSELA
Olivier Péréon	UNIVERS-SEL
Grégory Pitart	Coopérative Le Guérandais
Gilles Terrien	Paludier (en stage)
Anne Sophie Weber	Nature guide
Sečoveljske soline	
Flavio Bonin	Maritime Museum
Tomi Brezovec	University Primosrka
Damir Cendak	Soline Pridelava d.o.o.
Armand Faganel	University Primosrka
Klavdij Godnič	Soline Pridelava d.o.o.
Franco Juri	Maritime Museum
Ivana Mijatovic	Lepa Vida spa
Andrej Sovinc	Soline Pridelava d.o.o.
Lea Suligoj	Tourism office
Borut Rubinic	BirdLife
Læsø saltworks	
Bent Besthaven	Læsø Saltworks
Poul Christensen	Læsø Saltworks
Jess Jessen Klixbüll	Læsø Marketing ApS
Karin Krogstrup	Former nature guide
Lilli K. Jepsen	Læsø Museum
Leif Ladefoged	Læsø Kommune
Solveig Lynge	Morgenfruerne på Læsø
Helle Pedersen	Læsø Turist
Peter Singers	Læsø Marketing ApS
Finn Taul	Læsø Kur
Jens Vellev	University of Aarhus

Annex 3: Maps of cited salinas and saltscapes

The following maps show most of the salinas and saltscapes cited throughout the text. This is by no means an exhaustive or representative depiction of the salt-related sites in Iberia or Europe, but simply a visual guide to the reader of this thesis. A complete list of salt-related sites in Europe would take a tremendous effort and only partial maps or lists exist, as has been explained in the text.

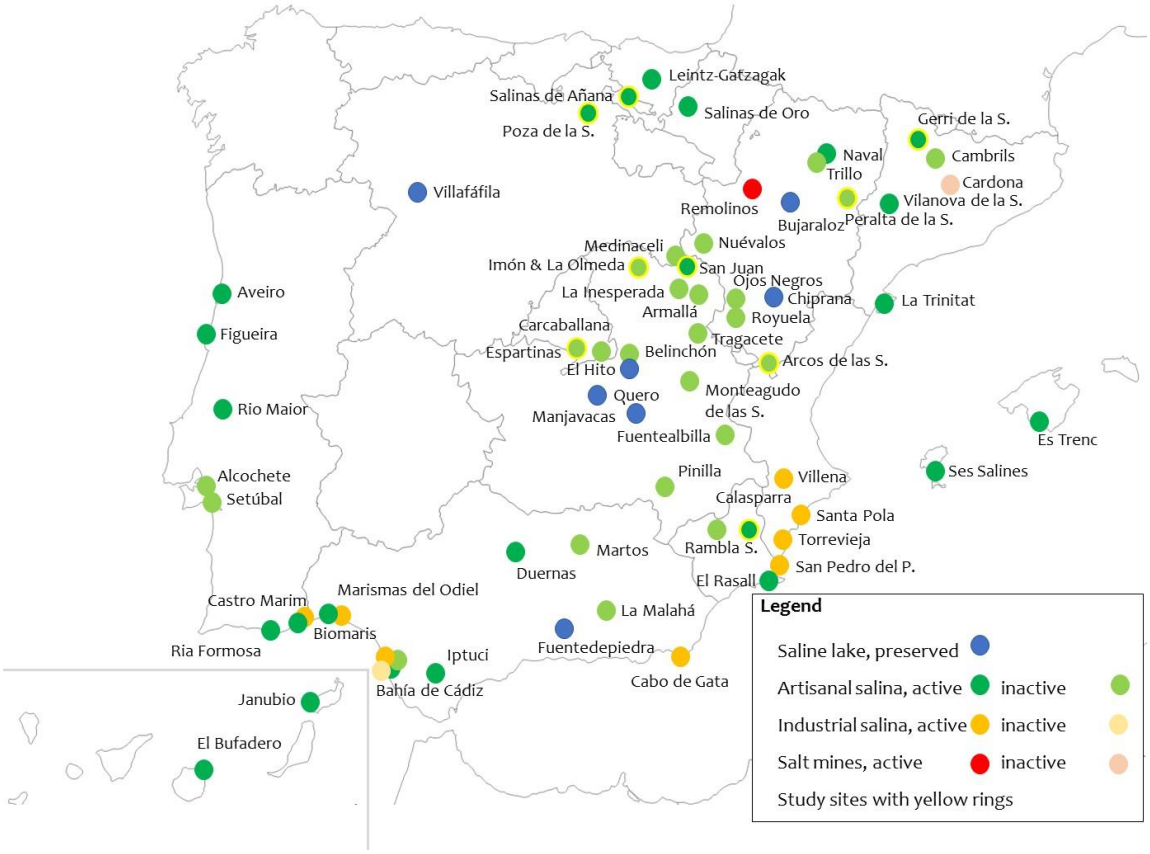


Figure A3.1: Map of Spain and Portugal with the salinas and saltscapes cited in the text (Source: Own elaboration)

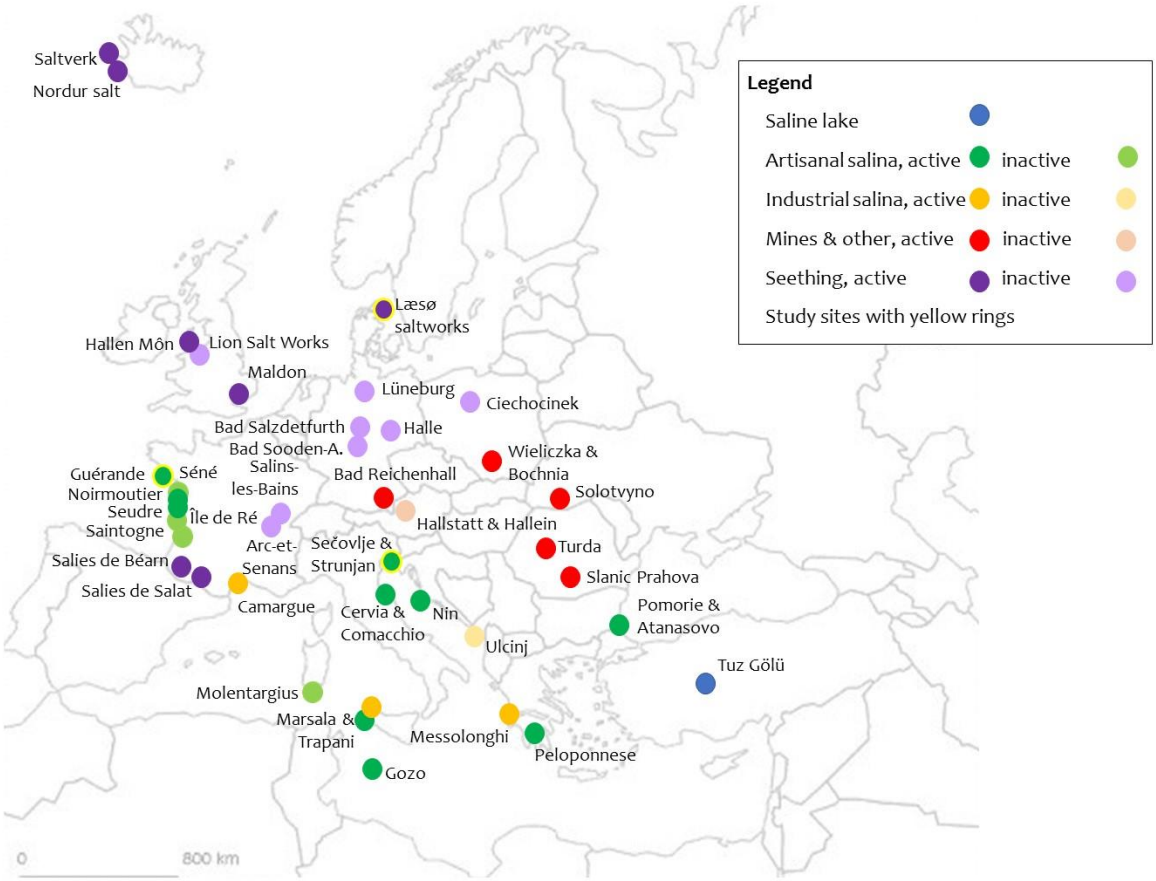


Figure A3.2: Map of Europe with the salinas and saltscapes cited in the text (Source: Own elaboration)